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T. PASCOE,  
*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### **First Aid to the Horse.**

In response to repeated requests from Branches of the Agricultural Bureau and numerous correspondents, the Department of Agriculture has issued a veterinary handbook, entitled "First Aid to the Horse." The author is Mr. Fras. Evelyn Place, B.Sc., M.R.A.S.E., B.V.Sc., M.R.C.V.S., &c., &c., formerly Government Veterinary Lecturer. In a space of 64 pages the author has dealt alphabetically with those diseases on which most inquiries were received, and it will be found that the list is fairly comprehensive for South Australia. By way of addendum is included a list of medicines, together with the doses of each for horses, cattle, sheep, pigs, and dogs. The price of the booklet is 3s., and it is obtainable from the Department of Agriculture.

### **Forthcoming Conferences: Hills, Murray Lands, and Eyre Peninsula.**

On September 30th Branches of the Agricultural Bureau situated in the Hills district will meet in Conference at Blackwood. Sessions will be held during the morning and afternoon.

This will be followed by the Murray Lands Conference, which is to take place at Karoonda on Wednesday, October 5th, and Thursday, October 6th. This Conference district, which was formerly part of the Pinnaroo district, comprises the Branches of the Waikerie, Loxton, and Paringa lines of railway, and the Conference arranged for October will be the first held in the district.

Eyre Peninsula Branches are to meet at the Government Experimental Farm, Minnipa, on Thursday, October 21, and Friday, October 22. The first Conference of this district took place last year, and it was generally regarded as one of the most successful Conferences ever held in connection with the Agricultural Bureau.

### **Sanitation.**

The provision of proper sanitary facilities is of vital interest to the individual and to the State. "The standard of civilisation in a community is evidenced by its public sanitary conveniences. Family refinement is gauged by the back yards, not by the front lawns," says the Permanent Head of the Department of Public Health of South Australia, Lieut.-Col. W. Ramsay Smith, M.D., D.Sc., F.R.S. (Edin.), in a booklet recently issued. This booklet, entitled, "The Theory and Practice of Sanitation in Country Places, including the Bacteriolytic Tank System," is worthy of the serious perusal of private individuals no less than of representatives of public bodies. The author deals with the various methods of disposing of human excreta, including the dry earth closet system and the bacteriolytic tank system.

**Women's Agricultural Bureau.**

At a recent meeting of the Advisory Board of Agriculture, approval was given for the formation of a women's Branch of the Agricultural Bureau at Saddleworth. This is the second women's Branch to begin operations, although there have been inquiries from several districts for information respecting the institution. The Branch at Riverton, the pioneer women's Branch of the Agricultural Bureau, has existed long enough to enable some idea to be formed as to the usefulness of the institution, and experience there has demonstrated that the Women's Bureau is destined to form a very beneficial force in rural life.

**A Loss of £6,000,000.**

It has been estimated that on an average the Commonwealth annually loses £6,000,000 of the value of its wheat, oats, barley, maize, potato, and fruit crop through the ravages of disease. Rusts, smuts, bunt, take-all, mildews, and septorias take a toll of from £4,000,000 to £4,750,000 worth of our wheat, whilst enemies of the fruitgrower levy tribute to the extent of up to £1,000,000. This loss is largely preventable. Much has already been done in the way of investigation and control of fungous, insect, and other diseases, but when it is realised that there is £6,000,000 to be won, it must be admitted that greater efforts are warranted.

**Imports and Exports of Fruits, Plants, &c.**

During the month of July, 1920, 3,450bush. of bananas, 1,854bush. of fresh fruits, 14,818 bags of potatoes, 662 bags of onions, 19 packages of plants, 36 packages of trees, 46 packages of seeds, and 3,505 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the "Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910." Of these, 82 empty wine casks, 1 package of plants, and 27 packages of trees were fumigated, 145 bags of potatoes (scab and eelworm) were returned to State of origin, and 7 bags of potatoes (scab and eelworm) were destroyed.

Under the Federal Commerce Act, 1,572bush. of citrus fruits, 20,537bush. of dried fruits, 61 packages of preserved fruit, 37 packages of jam, 2 packages of plants, and 2 packages of seeds, were exported to overseas markets. These were consigned as follows:—For London—7,749 packages of dried fruit, 15 packages of jam, 27 packages of oranges, and 9 packages of preserved fruits. For South Africa—3,262 packages of dried fruit. For India and East—54 packages of dried fruits, 2 packages of preserved, 2 packages of jam, 2 packages of plants. For Samoa—20 packages of jam. For New York—2,052 packages of dried fruit. For New Zealand—1,545 packages of citrus fruits, 7,420 packages of dried fruits, 2 packages of seeds, and 50 packages of preserved fruits.

Under the Federal Quarantine Act—4,448 packages of seeds, &c., were examined and admitted from overseas sources. Of these, 3 packages (175lbs.) were destroyed.

## DEPARTMENTAL DOINGS.

### AMONGST THE AGRICULTURISTS.

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) on Friday, August 20th, attended the annual Conference of Southern Branches of the Agricultural Bureau. This gathering was also attended by Capt. White, C.M.B.O.U. (Advisory Board), who in addition was present at the Conference of Pinnaroo District Branches on Thursday, August 26th.

The Director of Agriculture (Professor Arthur J. Perkins) delivered a lecture before a meeting of the South Australian Fruit-growers and Market Gardeners' Association at Campbelltown on August 2nd on the subject "Manures for Vegetable and Fruit Growing." On August 13th the Director attended the annual homestead meeting of the Hartley Branch of the Agricultural Bureau, on August 21st the Conference of Southern Branches of the Agricultural Bureau at Strathalbyn, and on August 26th the Pinnaroo District Conference at Lameroo. On August 27th the Director visited Murray Bridge and discussed the formation of a Herd Testing Association with the members of the local Branch of the Bureau.

The Superintendent of Experimental Work (Mr. W. J. Spafford) addressed the members of the Murray Bridge Branch of the Bureau on "Summer Fodder Crops" on August 10th. During the following week he visited the Hills and Southern districts for the purpose of laying out plots for testing the possibilities of tobacco growing. At various centres he attended informal meetings of the Agricultural Bureau. On August 25th this officer delivered an address "Green Manuring, and the Effects of Lime and Gypsum" before the members of the Nunkeri and Yurgo Branch of the Bureau.

### POULTRY.

The Government Poultry Expert and Lecturer (Mr. D. F. Laurie) on August 2nd inspected the poultry plant at the Pompoona Training Farm, and addressed the members of the local Branch of the Bureau. On the following day he visited the Monteith area. On August 12th he addressed the Milang Branch; on August 23rd, Blackwood; and August 25th, Crystal Brook; and on the day following he visited the Mount Remarkable Training Farm. On August 30th the Saddleworth Women's Branch of the Bureau was visited and addressed.

### FARM BUILDINGS, ETC.

The Field Engineer (Mr. J. Paull) during August visited Mr. H. G. Basham, Port Elliot, and provided plans and advice respecting farm buildings. He visited Monteith Flat, and provided Mr. R. G. Magor and Mr. McCulloch with plans for concrete silos. Mr. A. V. Leighton, Aberdeen, was supplied with advice respecting a proposed concrete building as a memorial for fallen soldiers. Advice on the erection of reinforced cement concrete water tanks was supplied to Mr. J. Hynes, Arthurton; information respecting the erection of a stone silo to Mr.

D. R. Longbottom, Brentwood; and plans of a reinforced concrete silo to Mr. B. B. Rugless, Clare. Mr. R. H. Freebairn, Brinkworth, was supplied with plans of stables.

#### DAIRYING.

The Assistant Dairy Expert (Mr. H. J. Apps) visited various dairymen at Kapunda, Woodside, Currenay Creek, Cobdogla, Berri, and Lake Bonney, and lectured at Ashbourne and Mypolonga.

#### HORTICULTURE, ETC.

The Horticultural Instructor (Mr. Geo. Quinn) spent the earlier part of the month in Queensland, attending the Conference of Fruit-growers. On August 27th he gave a pruning demonstration at Clare, subsequently addressing a meeting of the Agricultural Bureau.

Mr. C. H. Beaumont during the month visited Mypolonga and Murray Bridge, at each centre giving pruning demonstrations. On August 27th he addressed members of the Morphett Vale Branch of the Bureau on seasonable hints to vine and fruit growers.

#### GENERAL.

The Acting Secretary Advisory Board (Mr. H. J. Finnis) attended the annual homestead meeting of the Hartley Branch of the Agricultural Bureau and the Conferences of Southern and Peninsula District Branches.

Halidon Branch was visited by Mr. F. C. Richards on August 11th.

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#### TOBACCO CULTURE.

As an outcome of the recommendations of the Tobacco Expert of the Victorian Department of Agriculture (Mr. Temple J. Smith), steps have now been taken to test the possibilities of this crop in South Australia. Mr. Smith, during his recent visit to this State, selected several districts which he considered likely to prove suitable for tobacco culture. In each of these the Department of Agriculture has established experimental plots, in conjunction with and on the holdings of agriculturists selected by the local Branches of the Agricultural Bureau. The localities being tested and the gentlemen with whom the department is working are:—Williamstown, Mr. J. S. Hammitt; Lyndoch, Mr. G. W. Warren; Gumeracha, Mr. J. B. Randell; Mount Barker, Mr. W. F. Daddow; Ashbourne, Mr. A. E. South; Inman Valley, Mr. G. McCoy.

The Victorian Expert did not have the opportunity of visiting the South-East, but the Department has, nevertheless, made arrangements for tobacco to be tested there on the following holdings:—Kalangadoo, Mr. J. O. Jones; Coonawarra, Mr. W. Hoffmann; Naracoorte, Mr. W. W. Gould.

In addition to the official tests, numerous trials are being conducted by private individuals who have been supplied with small parcels of seed of different varieties.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

[Replies supplied by Mr. C. A. Loxton, B.V.Sc., Government Veterinary Surgeon.]

Hon. Secretary, Agricultural Bureau, Coonalpyn, asks treatment to gelding troubled with worms.

Reply—First prepare horse by soft feeding for 48 hours, then administer the following drench:—Oil turpentine, 1oz. to 2ozs., according to class of horse; spirits, ether nit, 2ozs.; linseed oil (raw), 1 pint. Enema of salt water to be used twice daily, or following powder:—Antimony pot. tartrate, 1½ozs.; ferri sulph., 1½ozs.; powdered gentian, 2ozs.; powdered aniseed, 2ozs. Divide into 12 powders. Give one twice daily; when finished follow with above drench.

"F. J. R.," Sandilands, via Ardrossan, has mare 9 years old, with constant evil smelling discharge from left nostril. Lining of nostril is inflamed, and the left eye has an unhealthy appearance.

Reply—if this case is old standing, as you say, the probability is that it is one of nasal gleet, or, again, it may be simply a case of acute catarrh. Try the following treatment:—Rest animal. Dissolve Epsom salts in drinking water. Give inhalations of eucalyptus and turpentine by means of the nose bag. Place a little straw on the bottom of the bag, pour boiling water over straw, then add 2ozs. turpentine and eucalyptus. Place bag on animal's head, leave for 20 min., care being taken to prevent suffocation. Repeat and apply embrocation to throat once daily. Do not purge the animal, and advise result in seven days.

"C. R. H.," Giles' Corner, has horse affected with worms. Animals stamp their hind legs and are rapidly losing condition.

Reply—Prepare your animals by soft feeding for 24 hours. Give the following mixture for heavy horses:—Turpentine, 1oz. to 2ozs.; spirits ether not, 2ozs.; linseed oil, 1 pint. For light horses, 1oz. turpentine. Give injection per rectum of salt and water. Examine legs for scales or skin diseases, which may be causing stamping. Report result in 10 days.

"C. M.," Bordertown, has Clydesdale stallion, legs below the knee breaking out in skin rash.

Reply—Attend to bowels. Wash affected limbs with soda water, dry thoroughly, use bran or sawdust rubbed in to assist drying. Afterwards apply the following:—Sulphur, 8ozs.; pot. carb., 2ozs.; oil tar, 4ozs.; oil linseed, 2 pints. Apply over affected parts. Wash off after third day and reapply.

Hon. Secretary, Agricultural Bureau, Yeelana, reports killing a sheep and found small blisters on liver and lungs, and on being opened these contained a clear fluid and small white specks.

Reply—The condition described is evidently one of hydatids. Infection generally takes place by contaminated drinking water. The white specks were the hydatids and the blisters the cyst wall.

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"W. J. M." Lameroo, reports 3 year old filly, had strangles in April. In May she had a relapse, and has eaten practically nothing for a fortnight.

Reply—The filly is suffering from general weakness following irregular strangles. She requires good feeding and nursing. Stable her at night and rug her during the day. Supply her with good nourishing food, and give her one tablespoonful of Fowler's solution of arsenic twice daily in the feed for a fortnight.

"A. J. B." Parakie, reports death of ewes heavy in lamb. Sheep lose use of legs, and in some cases are quite unable to rise off the ground. Froth issues from their mouths, and the deaths have taken place within a fortnight to three weeks of lambing.

Reply—The deaths appear to be due to eclampsia, a disease of pregnancy. There is little you can do in the way of effective treatment. The use of molasses in the feed might be helpful. Use about  $\frac{1}{2}$ lb. per sheep per day. Give affected ewes frequent doses of bicarbonate of soda. Half a teaspoonful every two or three hours in a little warm water.

"L. H. D." Keith, reports two colts with a fleshy growth inside right nostril, and milky discharge. Another colt has swollen lips.

Reply—The treatment of polypus in the nose is purely surgical. It is a rather unusual condition, and I advise you to do nothing at present, but report again in a week or two. Bathe the swelling on the lip with a lukewarm solution of alum, made by dissolving a tablespoonful of alum in a pint of water.

"G. H." Hookina, reports horse with a sore on back. The sore heals after the animal has been spelled for a month or so, but reopens after the horse is worked.

Reply—Clip the hair off the part and apply a little red blister. Rub this in thoroughly for five minutes. This should develop an abscess which can be opened as soon as it points. Treat it then as an open wound. Do not put a saddle on him until the wound has thoroughly healed.

"P. O. E." Quorn, asks if smutty chaffed hay is injurious to horses.

Reply—Hay badly affected with smut is injurious to horses. It causes irritation of the lining membrane of the nose, throat, and digestive tract. Poisoning by smut fungi sometimes occurs, the symptoms being dribbling of saliva, persistent chewing, staggering, and paralysis.

"W. A. T." Borrika, has mare four years with large swelling on chest.

Reply—This swelling is the result of an injury. If not very large it will slowly become absorbed without further treatment, or you may drain it by making an incision in the lowest part.

"J. W." Kersbrook, has aged mare off food, lies down and rolls, and turns head around towards flank. Urine very dark, and a number of small worms are passed from time to time.

Reply—The case is one of constipation colic. Give her turpentine, 2ozs.; raw linseed oil, 1 pint. Wash the bowel out with enemas of warm soapy water. The drench will also be effective for worms.



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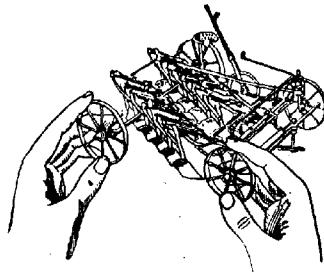
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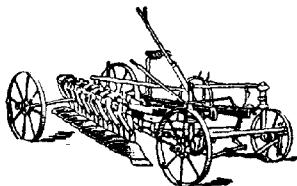
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**ADELAIDE**

**NORTH TERRACE.**

## PIG-RAISING WHERE LUCERNE CAN BE SUCCESSFULLY GROWN IN SOUTH AUSTRALIA.

[By W. J. SPAFFORD, Superintendent Experimental Work.]

On the surface, it appears very remarkable that pigs are not a much more important item in the farm livestock of South Australia than is the case at present, because they have proved to be well adapted to the climatic conditions of most of our farming districts, being prolific breeders, remaining extremely healthy and thrifty with the minimum of care and protection, and fatten very readily in all seasons of the year. Also, it is doubtful if the cereal grains can be raised anywhere at a lower cost than in this State, and it is a matter of common knowledge that not any of the domesticated animals make so much use of grain supplied to them as do pigs. Not only do pigs make most use in the converting of grain into flesh, but they are the only kind of meat-producing animals which can make full use of our waste grains, the available quantity of which will always be relatively large, whilst the present methods of harvesting our grain crops remain the vogue. Further, mainly because of the above-mentioned characteristics, there is no kind of farm livestock so easily bred and reared, and which proves so profitable in the process, when handled by only partly experienced breeders. The above facts certainly point to the pig as a very suitable animal for our State, but, unfortunately, in the past the absence of an export market for pig products has resulted in very erratic local markets, and on every recurrence of low prices the pig industry has had a big setback, and its history has been a series of ups and downs.

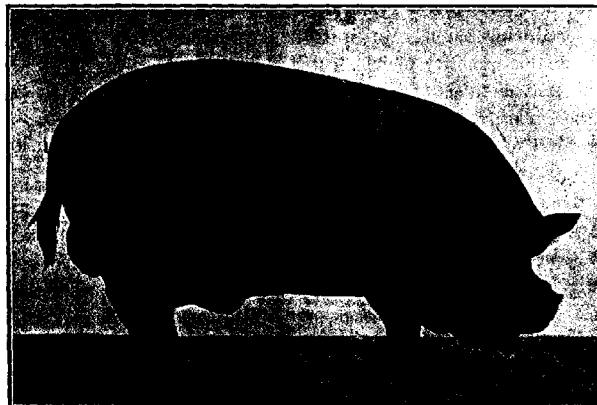
On present appearances, with the extreme shortage of meat in the world, which must be felt for years, and the tendency of our farmers to become livestock producers, as well as crop-growers, it looks as if the variations in prices for pigs will not be as extreme as in the past. This, because an unique opportunity has been opened up for us to get a footing in the world's markets, and the livestock producer of to-day is alive to the value of outside markets to stabilise prices, and when the extremely high prices of late years begin to slump, he will see to it that markets are opened up for pigs.

Besides growing grain very cheaply, of late years we have demonstrated that very heavy crops of lucerne can be grown economically on a comparatively extensive area of the State, and while our population remains small (with the inevitable dislike of much hand work, which appears to be a natural characteristic of most people in coun-

tries which are sparsely populated), there appears nothing at present so promising in the making of good profits from well-grown lucerne than the raising of pigs.

#### TYPE OF PIGS TO BE RAISED.

In whatever way pigs are to be raised, the type to be handled will always be decided by the market requirements, and the natural conditions in which the animals are to be reared, if full returns are to be secured from them. The market demands at present are for pigs for local consumption only, and the types that fulfil those requirements to best advantage are:—(1) Porkers, weighing from 60lbs. to 80lbs., which are comparatively short, deep, and very fat. (2) Baconers, weighing from 120lbs. to 160lbs., which are long, deep, and fairly fat. (3) Weaners, which are healthy and thrifty, and which, according to the feeding given, will make either the ideal porker or baconer as above.



Berkshire Boar.

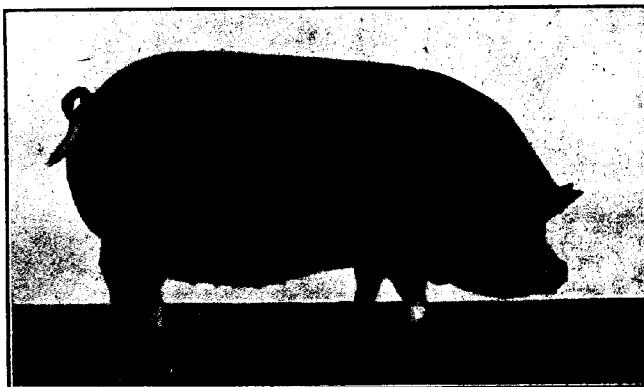
When we are supplying bacon in large quantities to the European markets we will very possibly then have to produce baconers weighing 200lbs. to 220lbs., with long deep sides carrying a big proportion of lean meat.

#### BREEDING VERSUS FATTENING STORE PIGS.

The fattener of store pigs must be assured of a full supply of animals of the right type just when he needs them; but the best of our pig markets are very erratic as regards the supply of store pigs, and the animals usually offered for sale are very mixed lots of all sizes,

ages, breeds, and types, and rarely in sufficient numbers to allow of much choice being made, so increasing the difficulties of fattening economically. With the trouble existing of securing suitable animals in sufficient numbers when required, and the ease with which the animals can be bred and reared in this climate in the present stage of our development, there appears to be every reason why the pig-raiser in South Australia should be a pig-breeder, particularly so if he intends to be a pig-fattener, for he will then get the double profit (*a*) on breeding and (*b*) on fattening.

If it should be decided to fatten stores, it must be remembered that the pigs making the most profit will be the ones that rapidly make one of the two ideals required by the market, and will be represented by young pigs, well developed for their age, with long deep bodies, strong backs, standing well on their feet, and having every appearance of health and strength.



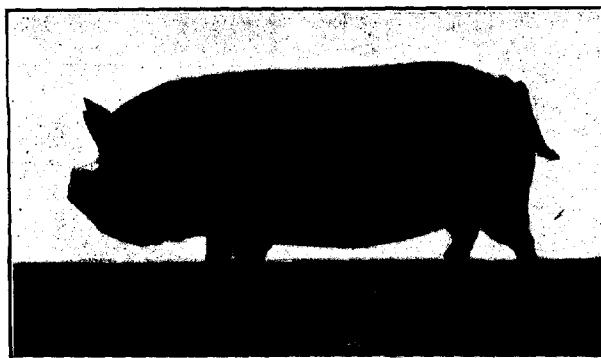
Berkshire Sow.

#### BREEDS.

Quite a number of distinct breeds of pigs have been introduced into this country, the main ones of which are Berkshire, Middle Yorkshire (Middle White), Tamworth, Essex, Large Yorkshire (Large White), Poland China, British Black, and Curly Coated Lincoln, but with the exception of the first two—Berkshire and Middle White—very few pure-breds remain. All of the breeds have been developed to suit certain conditions, and as the particular conditions for which most of the breeds were fixed do not exist in this State, they have proved unsuitable, and our present special requirements are adequately met by the Berkshire and Middle White. Of these two breeds, the Berk-

shire is the pig that is nearest to satisfying our present market requirements, and is closely followed by the Middle White; but this latter breed is gradually being altered to approach the Berkshire in everything but color, and really there is little to choose between them.

The essential characteristics of both breeds are:—Long low-set body, with long deep sides, strong back of medium width, deep shoulders, and heavy hams, short thick neck, short face, very much dished in Middle Whites, and distinctly dished in Berkshires, slightly upturned nose, and erect pointed ears. Character is stamped all over them, and they are stylish, active pigs. Both breeds mature early, and fatten very rapidly when put on suitable feed. The sows of both kinds make really good mothers, but the Middle White is a little more prolific than is the Berkshire.



Promising Young Berkshire Sow. Bred at Boorooroo Experimental Farm.

The main differences between these two breeds of pigs lie in their color and in their suitability to certain climatic conditions. The Berkshire is almost wholly black, having only six white points—star or splash on face, four feet, and tip of tail, whereas the Middle White is wholly white. The Berkshire is extremely hardy, and thrives in all variations of climate in the farmed parts of this State, and is particularly well suited to our districts with comparatively hot, dry conditions, whereas the Middle White does its best in our cooler districts, where it is not liable to be sun-sealed. The main trouble tending to make pigs unthrifty in South Australia is the presence of lice in large numbers, and where the trouble is existent, Berkshires suffer less from their attacks than do Middle Whites.

If pure-bred pigs are to be kept, the choice of breed lies between these two, and the deciding factor will be that of climate, for where

comparatively cool summers are the rule, the increased prolificness of the Middle White will counteract the hardiness of the Berkshire, and the fact that bacon manufacturers have a slight preference for the latter; but away from such climatic conditions the Berkshire is likely to prove the better. For the great majority of pig-raisers in South Australia the keeping of half-bred sows (between these two breeds) will suit admirably, for as a rule the half-bred sow is more prolific than either of the pure breeds, and is a better mother in every way. The simplest way to breed such half-breds is for the breeder always to purchase pure-bred pedigree boars for use on the sows he saves for breeding purposes, and then all sows whose sire was a Middle White will be mated to a Berkshire boar, and all sows sired by a Berkshire will be mated to a Middle White boar.

#### PIG-BREEDING.

As the chief aim in pig-breeding is the obtaining of the maximum number of piglets which will return the greatest profit when reared, all considerations doing something towards this must be kept in mind. The main factors tending towards success in this direction will be:—

1. Choice of breeding animals.
2. Care of breeding animals.
3. Management of piglets.

##### *1. Choice of Breeding Pigs.*

As prolificness is controlled very largely by heredity, the pigs to be used for breeding purposes—both boars and sows—should invariably be selected from parents that are proved heavy breeders. Animals so selected and given proper treatment and care, will almost invariably be prolific breeders themselves.

The quality of the piglets produced, and their chances of making good, will depend very largely on the general health of their parents, and so one of the main considerations in selecting breeding animals will always be the ensuring that both parents are naturally healthy and robust.

As the qualities that go to make the ideal pig, for whatever purpose the breeder has in view, are manifest in the shape and general appearance of the animal, these points must always be kept in sight when selecting animals for breeding.

For South Australian market requirements, which are (*a*) a porker of 60lbs. to 80lbs. weight with a rounded, finished appearance, and carrying a fairly high proportion of fat; (*b*) a baconer of 120lbs. to 160lbs. weight with long, deep sides and well rounded hams, the young pig likely to fill either requirement—depending on the manner of feeding from weaning onwards—is a Berkshire or Middle White

or a crossbred between the two, with long deep body and strong back, standing well on its feet, and which has a general appearance of health and strength. Such young pigs are usually obtained when the following parents are used:—

*Boar*.—He must be pure bred, and strictly true to the type of the breed he belongs to. He should stand up well on strong legs which are not too coarse, and show much character in being essentially masculine in appearance without being coarse, and appear fearless without being ferocious. He should have length and depth, and possess well-developed hind quarters, but his body must not be so long that he is weak in the back or slack in the loins. His back should be fairly broad, and, on looking on top of him, his sides should be nearly parallel. Boars that are vigorous at service, whenever called upon,



Middle White Boar.

usually have their organs of reproduction well developed. The weaknesses in boars which should be carefully avoided are hollow back, pinching-in behind shoulders, and weak front legs inclined to be knock-kneed.

*Sow*.—For breeding big litters of healthy young pigs, likely to fulfil our market requirements and prove profitable, the sow need not be a pure-bred, and, as a matter of fact, crossbred sows mated to a pure-bred boar are, on the average, more likely to do this than are pure-bred sows, but, whatever the sow's breeding, she must have much the same body conformation as the boar. She must have long, low-set body, with long deep sides and well-developed hams. Her back must be moderately broad and certainly strong, even to the extent of being roach-backed. Shoulders should be deep, but not masculine in appear-

ance, and her neck should be comparatively short and thick. Legs should be fine boned, but she should stand well up on them, without any sign of weakness. Besides a general healthy, vigorous appearance, she should be roomy to permit of the proper development, before birth, of a large litter. To properly rear her litter, for the first few weeks of their life, she must show promise of good udder and teat development, and in this connection every sow should show 12 or more good strong teats. Front legs being very close together or knock-kneed, and pinching-in just behind the shoulders, show want of room for lung development, and are serious weaknesses to be avoided.

#### *2. Care of Breeding Pigs.*

As the management and care of the breeding animals is just as important as the selection of the individuals to be used for the purpose, the greatest of care is necessary, if the best returns are to be secured.



Middle White Sow.

*Management of the Boar.*—As the boar will possibly be called on, when he is fully developed, to mate with 50 sows or more in the course of a year, much care must be shown in his rearing, so that he will be fit for the work in front of him. In this connection much will depend on his feeding and the work given him when young. (a) During early growth he must not be fattened, but by plenty of exercise, and the provision of flesh-forming rather than fattening foods, be kept in healthy, growing condition. In the lucerne-growing season this feeding would consist of grazing on the crop with the addition of  $\frac{1}{2}$ lb. to  $1\frac{1}{2}$ lbs. of grain per day from three months old to nine months of age, then gradually increasing the grain to 2lbs. up to 18 months of age. When the lucerne is not growing, nearly equal results will be secured by providing him with a full supply of well-made lucerne hay in a rack, and

as it is then winter time, a slightly increased grain ration. The above quantities of grain mean first-quality huskless grains, such as maize, rye, or wheat, and if barley or oats are to be used the amount should be increased by about one-quarter. (b) A well-grown young boar can be mated with sows when from eight to nine months old, but then only by giving him comparatively long spells between service. This care not to overwork him should be continued until he is about 18 months of age, when he can be put to his full work.

More is got out of a boar if kept by himself in a yard large enough for him to get plenty of exercise, and to have the sows brought to him for service as they come in season. In some methods of handling pigs, the keeping of the boar by himself is rather cumbersome, and, when so, he can be turned out in a field with the sows with quite satisfactory results, so long as the breeder is prepared to replace boars so handled much sooner than would be necessary if kept by themselves, having their matings regulated.

Boars never work well if allowed to get too fat, and they naturally knock out too soon if allowed to become very poor, so the aim should be to keep them in fair condition during all their life. This is easily done where kept by themselves, by keeping them supplied with unlimited grazing lucerne or lucerne hay, and controlling the amount of grain supplied to each animal, which will vary from 2lbs. to 4lbs. or so, according to the size, power of making use of feed, &c., of each individual. Where the boar is run with a number of sows it will sometimes be necessary to put him by himself to receive extra feed, or if he bullies the sows at feeding time, getting more than his share of the grain supplied, it may then be advisable to remove him and reduce his condition.

*Management of the Sow.*—As the sow has to carry the young pigs as well as rear them from the first few weeks of their lives, naturally she has to receive a good deal of attention. Like the young boar, she should not be allowed to become really fat whilst young, but from weaning until old enough to be mated should be kept in healthy growing condition. This period will be from two months old until from eight months to 12 months, and is best attained by placing the young sows soon after weaning on to good lucerne pasture, and providing them with a daily ration of from  $\frac{1}{2}$ lb. to  $1\frac{1}{2}$ lbs. of crushed grain, gradually increasing the amount supplied as they get older. It is quite essential that the young sows—young boars, also, for that matter—should be provided with proper protection whilst out in the pasture fields: in the summer for shade and for warmth in the winter. Adequate shelter allows the pigs to do on less feed than if left exposed to all weathers, and often means the difference between regular healthy

development on the one hand and more or less stunted growth on the other. Depending on the individual development and general strength and health of the young sows, they will be mated with the boar when between eight months and 12 months of age, and, after being stinted, they should have their allowance of grain increased a little, so that they are in good condition—not butcher fat—at farrowing time. About a week or so before a sow is due to farrow, she should be removed from the company of other pigs, and be kept by herself. In those districts of this State not subject to cold, bleak weather in winter, excellent results can be secured with pig-breeding without resorting to sties, and then the sows will each farrow in a small yard, say, 30ft. long by 15ft. wide, in which is placed a cosy, well-constructed brush or straw shed, with a wind-break on the side from which the rough weather usually comes. Where cold, bleak weather is the rule, the sows should be allowed to farrow in warm, well-ventilated sties. After farrowing, and whilst rearing her litter, the sow should be supplied with all the green lucerne or lucerne hay that she will eat, and from 6lbs. to 8lbs. of crushed grain daily for the first three weeks. After the young pigs have reached the age of three weeks or so, they will begin to feed from the trough, and unless provision is made for them to feed away from the mother, the amount of crushed grain provided must be gradually increased as the youngsters grow.

The young pigs will be weaned at about eight weeks old, and a few days after the young pigs are removed the sow will come in season, when she should be immediately put to the boar. If full returns are to be secured from the sows kept, they should have no idle time, and by mating them when they first come in season after rearing a litter, the breeder ensures all sows producing and rearing two litters each year. As soon as stinted, the sow will again go out to the lucerne field, or to a field where she is provided with all the lucerne hay that she can eat, and receive about 2lbs. of crushed grain daily, to build her up for the next litter.

If not breeding pedigree pigs for stud purposes, but only producing pigs for fattening, it does not pay to keep sows until old, for, although most of them remain good breeders for a number of years, the early maturing qualities of the young often suffer, and the litters are often composed of youngsters of different sizes, &c., and so it is wise policy to breed from young vigorous sows, and when they reach the age of four years to turn them into the fattening field.

### 3. *Management of the Piglets.*

Although it is the usual practice, and quite a wise one, to leave young pigs with their mother until eight weeks or so old, they are not

wholly provided for by the mother during that period, for they begin to eat from about the time they are three weeks of age. As soon as this stage is reached, provision must be made for them if they are to be made the most of. If at all convenient they should be fed in a trough, separated from their mother, by providing a hole in one wall of the sty, or in one side of the small yard in which they were born, sufficiently large to allow the piglets out, and too small for the sow. Under such a system proper control can be kept of the food for them. For these small pigs, pollard is a very good form in which to supply grain food, but either maize, wheat, barley or rye is as good or better if ground finely enough, and should be given at the rate of about  $\frac{1}{2}$ lb. per head per day, with 1lb. of chaffed lucerne hay to start with, increasing the quantities as they get older. The grain meal must not be fed dry, but should always be mixed with the lucerne chaff and enough water to make a paste of creamy consistency. Where skim-milk is available it can always be used with advantage for young sucking pigs, but where many pigs are being reared it is wise to use this milk for the young pigs just weaned, to reduce to a minimum the inevitable check that follows the removal from the mother.

All boars not wanted for breeding purposes should be castrated between one week old and weaning time, preferably nearer the former age than the latter. If this is done whilst still on their mother, the check given to them is hardly noticeable, whereas if left until after weaning, their development is naturally thrown back.

When the young pigs have reached the age of eight weeks, they will be completely weaned by removal from their mother, and if this sudden weaning is not to check them, they must receive careful and good feeding. If the piglets have been fed in a trough separated from their mother whilst they were still suckers, no trouble will be experienced in keeping them growing without noticeable check. Where skim-milk is available these weaners should receive a gruel of about  $1\frac{1}{2}$ lbs. finely ground grain (maize, wheat, barley, rye, or pollard),  $\frac{1}{2}$ lb. chaffed lucerne hay, 3lbs. skim-milk, and 3lbs. of water per head daily; but, although skim-milk is considered by many as quite essential for weaners, and there is no doubt about its value, still extremely good results can be secured without it, where lucerne is obtainable; and the daily feed per head would then be a gruel made with  $1\frac{1}{2}$ lbs. finely ground grain, 1lb. chaffed lucerne hay, and 6lbs. water. Where green lucerne is available, equal or better results will be secured by using it in place of lucerne hay, but in all rations four times as much green lucerne will be necessary as if used as hay. The weaners should be fed at least three times a day, and it would be better if the feedings could be given even four or five times.

After feeding the weaners for a fortnight or three weeks in a sty or small yard, they can go out to pasture, and commence the fattening process, with the addition of grain, if it is intended to produce porkers or baconers for the market.

#### MARKETING PIGS.

The special market requirements to be filled by the pigs raised will control what the feeding of the animals is to be; but it will first be necessary to decide what particular trade is to be catered for. The size to which the pigs are to be raised before selling them will depend mainly on what feeds, other than lucerne, are produced on each farm, and on the distance from and the convenience for reaching the market, and will be something as follows:—

Where the proportion of lucerne grown is high compared to the grain produced on a farm conveniently situated as regards approach to a good market, it is doubtful if fattening pigs much past the weaning stage will prove as profitable as quitting all pigs raised, except sows kept for breeding purposes, as *weaners*.

Where the markets are not very convenient to get at, but still close enough so that the pigs will not be more than one day between the farm and the sale, and where a fair quantity of grain is produced, it will pay to raise *porkers*.

Where a large quantity of grain is harvested, as well as lucerne, on a farm awkwardly situated as regards markets, the pigs should be raised and sold as *baconers*.

#### MARKETING PIGS AS WEANERS.

The demand for first-quality weaners is always good, as the majority of farmers who raise a few pigs on the by-products of the farm, dairy, or garden find it more convenient to them to buy store pigs and fatten them, rather than breed their own. This regular demand only applies to the very best of young weaners, and at those times when the market is well supplied anything but first quality piglets sell at fairly low figures. The necessity of getting weaners into the market with their full "bloom" still on them, confines this class of trade to breeders situated close enough to the market to be able to take the youngsters straight from their mothers, and get them to market in a trolley or some such conveyance, so that they are sold the same day as weaned. Failing this closeness to market, and still the desire, or the need, to sell the pigs bred as youngsters, the best proceeding is to wean the piglets at eight weeks old, and carry them on the farm for from a fortnight to a month, and sell them as *slips*. Providing that the "slips" have been properly fed, as described above, and have got over

the check from weaning, they will not suffer much in appearance if sold a day after being removed from the farm. As in the case of weaners, it must be remembered that the regular buyer of store pigs is an expert in judging what will do best with him when he starts fattening them, so it is quite unwise to attempt to work up a name for "slips" unless they are reared properly and put in the market in the best of order.

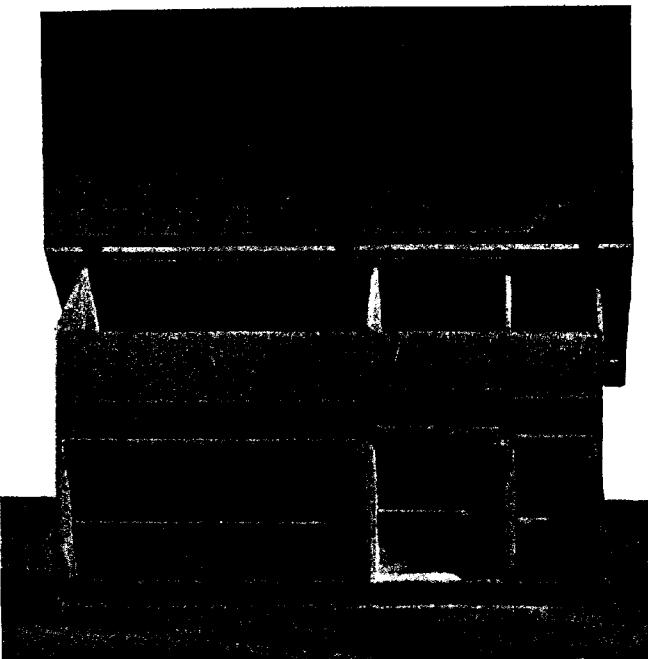
Where possible to practise it, the raising of weaners for the market is the most attractive of pig-raising propositions on lucerne, as the work to be done is reduced to a minimum, and, on the average, the returns are very high. One acre of well-grown lucerne will carry about eight mature pigs for the year, without grain being supplied, by grazing the pigs on three-quarters of an acre during the growing season, and feeding them on the hay made from the remaining quarter-acre during the off-season for the crop. This, of course, is not the correct way to feed lucerne, because the crop contains too low a proportion of fat-forming nutrients, and much valuable protein food is wasted by passing through the animals whilst they are getting their body requirements of carbohydrates and fats. Pigs, to be fed economically on lucerne, should receive some grain, and when the sows kept get their full supply of lucerne—grazing and hay—and 2lbs. of crushed grain per day whilst in the field, and 6lbs. to 12lbs. of grain per day whilst rearing their litters, one acre of good lucerne will certainly carry 12 sows a year, and in some cases more. As each sow should have and rear every year two litters of eight pigs each, the proposition of breeding pigs and selling them as weaners is certainly attractive.

#### MARKETING PIGS AS PORKERS.

As the porker wanted in our markets is a small, very fat pig, weighing from 60lbs. to 80lbs., the youngsters must be fed for fattening from the time that they are weaned. This will best be done by providing all the crushed grain that the pigs will eat whilst grazing on a lucerne crop or receiving their full requirements of lucerne hay, remembering, of course, that the youngsters will not be turned out to graze until they have got over the weaning, by feeding as described under the heading "Management of the Piglets." When first put on to the lucerne with full grain ration, the young pigs will require about 2lbs. of crushed grain per day, which will be increased, as it is found that the animals clean it up, to about 3lbs. or a little more per head per day, as they approach the finishing weight. If fed as above, these porkers should be ready for market at four and a half months of age.

**MARKETING PIGS AS BACONERS.**

As the baconer that brings the best price per pound does not carry too much fat, but must be long and deep, the pigs must be allowed to grow for some time before commencing to fatten them. They will be weaned as described above, but when turned out to graze the lucerne, will receive only a limited supply of grain for the first six weeks or so, and the only grain necessary will be from 1lb. to  $1\frac{1}{2}$ lbs. to start with, gradually increasing it up to about  $2\frac{1}{2}$ lbs. per head per day in the six weeks or so. From then onwards, like the porkers, they



Self Feeder Used at University of Illinois Agricultural Experiment Station.

should have access to all of the grain they will eat, and for the purpose they will take about 3lbs. a day at commencing, and a little over 4lbs. per head per day at finishing, which should be arrived at when the pigs are about six and a half months old.

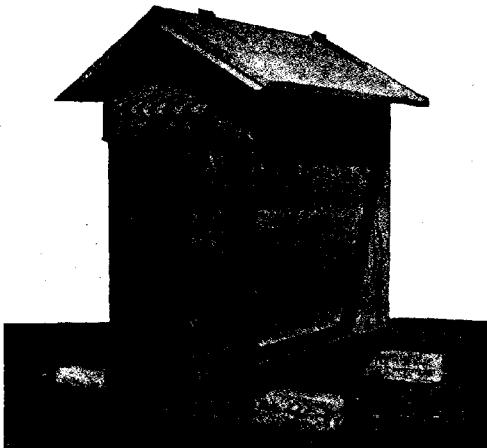
**METHODS OF FEEDING THE GRAIN.**

In the United States of America, where much work has been done with the raising and fattening of pigs, it has been found, without a shadow of doubt that, when feeding a full grain ration to pigs,

easily the best results are secured by using a self-feeder. Not only does each individual pig get all of the grain it wants, but it can go and get it when it wants it, and does not have to push and fight other pigs as soon as the feed is put in the trough, as always happens when the open trough is used. Naturally, the use of a self-feeder considerably reduces the work to be done by the man caring for the pigs, but, what is most important, the animals being fattened make a more profitable increase in live weight on a given weight of grain by supplying it in this way.

#### ADDITIONS TO THE FEED.

It is generally recognised that certain of the mineral salts aid digestion, and tend to keep animals in a good state of health—the pig

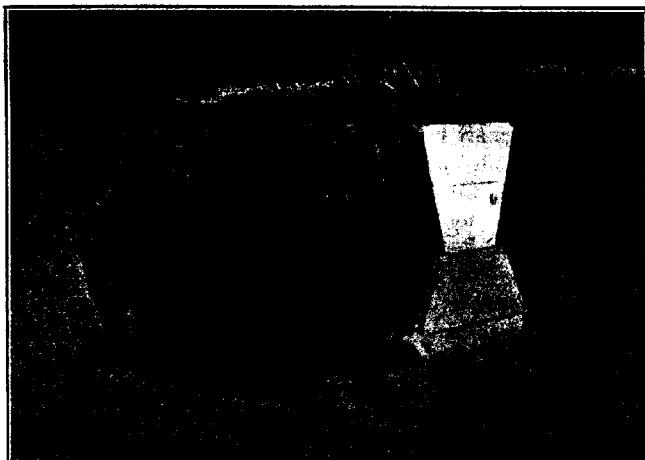


Simple Self Feeder, for Mixture of Minerals. Used at University of Illinois Agricultural Experiment Station.

as much as any animal—and it is the usual practice to keep pigs well supplied with a mixture of them. Charcoal and salt help digestion, and tend to keep animals free from internal parasites such as worms; phosphoric acid and lime encourage growth and the formation of bone; sulphate of iron helps to keep the blood in good order, and a mixture of these substances in something like the following proportions should always be kept before pigs:—Charcoal 4, salt 3, lime 3, superphosphate 1, sulphate of iron 1. This mixture should be kept in a self-feeder in all fields in which pigs are kept, so that they can take all they need of it.

**WATER FOR PIGS.**

Pigs kept for breeding need about a gallon of water daily for every 100lbs. of live weight, and when fattening a little more, so it is a very important item in connection with the keeping of this form of livestock. Wherever kept—fields or sties—there should always be available a plentiful supply of good water. Where pigs are being fed a given weight of grain daily, and not a full ration, some of this water will be used in mixing up the crushed grain, or the grain and chaffed lucerne into a gruel, but where the self-feeder is being used, all of the water must be supplied separately.



Rack for Feeding Lucerne Hay or Green Lucerne. Used at Idaho Agricultural Experiment Station.

**GENERAL CARE IN FEEDING PIGS.**

It is quite a recognised thing that, in the feeding of animals, more use is made of the feed supplied if all feeding appliances are kept scrupulously clean. Although this is very often lost sight of where pigs are concerned, nevertheless it holds good in their case, as well as with the other forms of farm livestock. The form in which feed for pigs is so often supplied—gruels or wet mixtures—makes the danger from foul feed greater than with the other animals, because here, if feeding utensils are not kept clean, the troughs, &c., quickly become sour, and for a certainty this affects the digestion of the animals, even if worse troubles do not follow.

All animals, particularly young ones, do better if they receive their feed two or three times a day rather than once only, and where

the self-feeder is not being used, the feed to be provided each day should be halved and supplied in two lots.

#### FEEDING THE LUCERNE TO PIGS.

Much greater stock-carrying capacity is obtained from lucerne if stock are never grazed on it, and then the whole of the crop must be cut and fed to the animals in other fields. This applies to the feeding of pigs as well as to other forms of farm livestock, but it entails much work, and, if handled intelligently, pigs can be grazed on the lucerne crop without injuring it very much, and without reducing the returns very considerably. In this connection there are a few essentials that should not be neglected:—(a) The crop must be well established before pigs are ever turned on it to graze, and even in the best of lucerne conditions this will mean that the pigs are not put on until the second year of growth. (b) The crop must never be overgrazed, for if pigs are kept on any particular plot too long they will kill out many plants and root up the ground. (c) The correct way to graze lucerne is to divide the crop into many small fields, put enough pigs on one to feed it down quickly, then move them to next field. (d) Part of the lucerne plot must be kept for hay, to supply lucerne when the crop is not growing; from one-quarter to one-third of whole crop should be cut for hay for pigs. (e) Care must be taken to make hay of good quality, and when this is done it can be fed whole or chaffed; but if, as is sometimes the case, brittle hay is manufactured it should be ground up instead of chaffed. (f) Racks should be provided in which to feed all hay or cut green lucerne to the pigs.

#### FENCING FOR PIGS.

One of the main considerations in the pasturing of pigs is to provide fences that are absolutely pig-proof, but without such fences satisfaction and full success can hardly be expected.

For the fences surrounding the grazing fields large-mesh heavy netting or spring-coil both make a suitable job; but better satisfaction will be found from a dropper fence, made by spacing the wooden fencing posts 12ft. or 14ft. apart, placing one heavy barb wire on the ground level, and seven plain wires, the first one 2in. from surface of the ground, then a space of 4in., then 4in., then 5in., then 7in., then 9in., and then 9in. When these wires are tightly strained up, floating wooden droppers are securely fastened to all wires at a spacing of 2ft. apart.

For the small yards in which sows are to farrow, or in which the young pigs are to be weaned, the same kind of fence is quite suitable, but the droppers should then be placed about 18in. apart.

Where plenty of timber which splits easily is available, a "slat" fence, made by fixing slats about 3ft. 3in. by 3in. or 4in. by 1in. between two twisted wires top and bottom, is ideal for small yards, &c.

#### GRAIN PRODUCED ON THE FARM.

If maximum returns are to be secured from the pig-raising operations, all of the grain necessary, as well as the lucerne, should be grown on the farm; but as the amount of grain used per acre of lucerne grazed is high, it will be extremely difficult to carry out on most farms. For instance, breeding pigs to sell as weaners, on the method of feeding shown above, will require about 300bush. of grain to be fed with each acre of lucerne, and if the young pigs are to be fattened quickly, somewhere about 800bush. of grain will be needed for every acre of lucerne grazed. On a small holding it is often possible to grow a comparatively large area of lucerne well, when but little grain can be produced, unless the conditions also favor the maize crop, and the way out is to purchase the bulk of the grain to be used. Where grain has to be bought, it will possibly pay to reduce the amount of grain used—recognising that the pigs will then take longer to develop—and raise the pigs largely on the lucerne. Fewer pigs will be carried per acre and less profit earned from the lucerne crop, but the work will be simplified and the returns remain high. Where much grain is produced on a farm that can grow good lucerne, it will take a comparatively small area of lucerne to convert the grain into pork at a return for the grain which will be, as a rule, much higher than the market value of the grain.

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## MOTOR TRACTOR TRIALS AT TURRETFIELD EXPERIMENTAL FARM.

The Director of Agriculture (Professor Arthur J. Perkins) has supplied the following report on the results of the Field Trials of motor tractors held on the Turretfield Experimental Farm, in the month of July, 1920.

#### SCOPE OF THE WORK.

The main object of these trials was to determine the practical value of motor tractors when used as power to haul ploughs under existing local economic and climatic conditions. Competing tractors were asked to work under official supervision for one calendar month, namely, from the 1st to 31st of July, inclusively. As a matter of fact, the trials extended into August to make up for one day's holiday taken in connection with the visit of the Prince of Wales.

**AGRICULTURISTS  
CAN SECURE  
TECHNICAL ADVICE  
ON  
FARM BUILDINGS,  
SILOS,  
TANKS,  
SHEEP DIPS,  
REINFORCED CONCRETE GENERALLY,  
TOGETHER WITH  
PLANS AND SPECIFICATIONS,  
AND ASSISTANCE AND SUPERVISION  
IN CONSTRUCTION,  
ON APPLICATION TO THE  
DEPARTMENT OF AGRICULTURE,  
ADELAIDE.**

**LOCAL FIRMS CONCERNED.**

The total area of land available for these trials was represented by the area usually fallowed at Turretfield in the course of a season; and as each tractor was expected to plough continuously for a full month, the number of competing tractors had naturally to be limited. I did not anticipate that we could find room for more than four of them: eventually, however, we found ourselves with more room than competitors. The following firms were approached on the subject:—

Messrs. Clutterbuck Bros., representing the "Universal" and the "Bates' Steel Mule" tractors.

Messrs. Duncan & Fraser, Limited, representing the "Fordson" tractor.

Messrs. International Harvester Company, representing the "Titan" tractor.

Messrs. Norman Machinery, Limited, representing the "Normac Hart Par" tractor.

At the last moment the International Harvest Company withdrew on the grounds that they had no tractor left for the competition; and Messrs. Norman Machinery, Limited, expressed their inability to take part in the competition because they were already fully occupied in other parts of the State during the month of July.

Eventually two tractors only were entered for the trials, namely, the "Fordson," of Messrs. Duncan & Fraser, Limited; and "Bates'" Steel Mule," of Messrs. Clutterbuck Bros.

**WEATHER CONDITIONS.**

On the whole, weather conditions at Turretfield throughout these trials were ideal from the point of view of general fallowing operations. June rains had been heavy, but they left the land in very good condition for ploughing. The total fall for July was 1 $\frac{3}{4}$ in., including two moderate falls only, of 44 and 39 points respectively, neither of which led to suspension of work. Weather conditions, therefore, were all in favor of the tractors: this is regrettable, as it would have been of interest to see how they behaved relatively to horses under comparatively wet ploughing conditions.

**THE "FORDSON" TRACTOR.**

The "Fordson" started work on the 1st of July, and was continuously in work until the 2nd of August inclusively. An additional day in August was included in the trial to make up for one day in July allowed as a holiday in connection with the visit of the Prince of Wales. The number of actual working days was therefore 27, i.e., a full calendar month exclusive of 4 Sundays. During this period the "Fordson" hauled a three-furrow stump-jump Shearer plough, cutting plough furrows 8 $\frac{1}{2}$ in. in width, and representing, therefore, a slice of earth inverted for each trip of 25 $\frac{1}{2}$ in. in width.

The area ploughed during the course of this trial was 113.52 acres: the first 36 acres ploughed consisted partly of rather light sandy soil, and partly of moderately stiff clay; the balance of the area ploughed is described by the manager as being black and red Bay of Biscay soil. The first 36 acres were ploughed to a depth of 5in. and the balance

to an average of 5½ in. The manager reports the work to have been well done, except for the headlands, which were not very well finished.

These 113.52 acres were completed in 207 hours 45 minutes. These working hours are computed from the time the driver left the farm buildings to knock-off time, and include any interruptions that may have occurred in the course of work. It follows, therefore, that actual work done was at the rate of 0.54 acres per hour, or a shade over half an acre, and that an average of 7 hours 42 minutes was worked during the 27 days.

During the whole period, time lost for oiling, attention to plough and minor repairs, amounted to 20 hours 25 minutes or about 45 minutes per day.

#### COST OF PLOUGHING BY "FORDSON" TRACTOR.

If we assume an 8-hours working day, the "Fordson" hauling a 3-furrow stump-jump plough would cover 4.32 acres per day which, as will be shown later on, is the exact average area covered by a ten-horse team hauling a 5-furrow stump-jump plough on the same land. It may be said, therefore, that when faced with favorable ploughing conditions the "Fordson" can do the work of a ten-horse team. I shall now proceed to show at what cost this work was done.

A statement of the costs of an operation such as ploughing is always difficult to draw up, because it must include not only out-goings for expenditure actually incurred, but in addition, a fair estimate for depreciation, wear and tear, etc., of whatever machinery may have been employed. Hence, I think it necessary to follow my statement with full details as to how it has been arrived at.

#### Statement of Cost of Ploughing per day (4.32 acres) by a "Fordson" Tractor.

	£ s. d.
Fuel (petrol and kerosine) . . . . .	1 10 3
Lubricating oil . . . . .	0 6 10
Interest on capital value of tractor . . . . .	0 2 2
Depreciation on tractor . . . . .	0 8 6
Wages of driver . . . . .	0 16 6
Depreciation on plough . . . . .	0 1 6
Interest on three-furrow plough . . . . .	0 0 9
Plough shares and grease . . . . .	0 2 0
Estimated proportion of repairs . . . . .	0 2 0
Total . . . . .	£3 10 6

Hence, on the above estimate it cost £3 10s. 6d. to plough 4.32 acres 5 in. to 5½ in. deep, i.e., 16s. 4d. per acre.

#### DETAILS OF STATEMENT.

*Fuel.*—The 113.52 acres were ploughed at a cost of 282galls. of kerosine and 4galls. of petrol, representing 2.48galls. of kerosine and 0.035galls. of petrol per acre. Hence—

	£ s. d.
2.48galls. of kerosine, at 2s. 9d. . . . .	0 6 10
0.035galls. of petrol, at 3s. 9d. . . . .	0 0 2

Total cost of fuel per acre . . . . .	0 7 0
Fuel for 4.32 acres . . . . .	1 10 3

*Lubricating Oil.*—Twenty gallons of lubricating oil were used throughout the test, representing 0.176galls. per acre. This oil is valued at 9s. a gall., or 1s. 7d. per acre, and 6s. 10d. for 4.32 acres.

*Depreciation and Interest on Tractor.*—The local selling price of this tractor is £425. I am of the opinion that under ordinary farm working conditions it should be written off in five years, representing an annual debit of £85. In any statement of costs this £85 has to be spread over the actual working days of a single year. I have assumed in this connection that in the course of a year the tractor would have 200 working days; and this, in my opinion, is a high estimate, even if we include road work and such stationary driving as the tractor might do. On this basis we have 8s. 6d. depreciation per working day. Interest is determined on the basis of 5 per cent. on the value of the tractor spread over 200 days.

*Wages of Driver.*—Throughout the trial the tractor was in the hands of a very competent driver, who got the very best out of his machine. It cannot be expected that an ordinary farm hand would do equally well with it. Hence, I feel justified in putting wages at 16s. 6d. a day, which, after all, is moderate for a good mechanic.

*Depreciation and Interest on Plough.*—The value of the three-furrow plough is £53 15s.; this sum has been written off on a 10 years' basis, representing £5 7s. 6d. per annum, which should be spread over an average of 70 working days, or 1s. 6d. per diem. Similarly, interest is calculated on a 5 per cent. basis, spread over 70 days.

*Plough Shares and Grease.*—Two shillings per day is normal for this item at present prices.

*Estimated Cost of Repairs.*—This is difficult to arrive at: I have assumed £20 per annum, which is, in my opinion, very moderate, and represents 2s. per working day. As to actual repairs during the trial, the manager reports as follows:—"Breakages consisted of two, one a minor one requiring repairs to a coil, and one in which some of the spokes of the off-side driving wheel broke away from the hub. This was repaired by a plate, which was not satisfactory, and the following day six plates were put on the spokes of the wheel; these plates were cut ready to fit, and were brought up from Adelaide by a man in a motor car on both days, and fitted in the field to save time. In the case of a farmer, delays would have been necessary, or else the cost of bringing a mechanic to the field must be added as part cost of these repairs. These repairs were only temporary, so as to enable the tractor to last out the trial, a welding, or recasting of the spokes into the hub, being necessary to make anything like a proper repair."

*Extras.*—It should be added that in this statement of costs, no account has been taken of the cost of delivering fuel and water in the field. This work occupied a man and a dray for 4½ hours during the course of the month, or about 4d. a day and 1d. an acre.

#### HORSE TEAM.

In the field in which the "Fordson" completed its trial, i.e., on the Bay of Biscay land, a 10-horse team, hauling a five-furrow Shearer stump-jump plough, was set to work on July 14th, completing the job on August 2nd, at the same time as the tractor.

The land was ploughed an average depth of 5½in., the work done being good, and the headlands being better finished than those of the tractor. The width of furrow cut was 8in., representing a slice of earth inverted 40in. in width for every trip of the plough.

This team was at work continuously for 17 days, during the course of which 74 acres were ploughed. And if we assume the usual eight hours working day, this represents ploughing at the rate of 0.54 acres per hour, or 4.32 acres per day, the exact figures already recorded for the "Fordson" tractor hauling a three-furrow plough.

#### COST OF TEAM PLOUGHING.

And, in the circumstances, what is the cost of team ploughing 5½in. in depth on soil of this character? No doubt for the purpose every farmer has his own estimate: for purposes of comparison, however, it is essential that we should draw one up. This has been given below with detailed explanations to follow:—

#### *Comparative Statement of Cost of Team Ploughing at Turretfield per Day (4.32 acres).*

	£ s. d.
Depreciation per day on 10 horses . . . . .	0 1 10
Interest on capital value of horses . . . . .	0 0 11
Keep per day of 10 horses . . . . .	0 17 10
Depreciation of five-furrow plough . . . . .	0 1 11
Depreciation on harness and swings . . . . .	0 0 4
Interest on five-furrow plough . . . . .	0 1 0
Shears, grease, &c. . . . .	0 2 0
Driver's wages . . . . .	0 12 6
 Total cost per day . . . . .	 £1 18 4
Cost per acre . . . . .	0 8 10

#### EXPLANATORY DETAILS.

*Depreciation of Horses.*—Depreciation on horses is not easy to establish: apart from accidental deaths, there are some farmers who, by breeding and subsequently selling their horses young, rarely lose much on them. Nevertheless, for purposes of comparison it is essential that some figure representing yearly depreciation should be given. I have assumed the horses to be worth £25 each, which to-day is very fair value, and that in the course of the year they average 275 working days. This I look upon as a very fair estimate of what actually takes place on average farms. Finally, I have assumed a horse to have 10 working years, and have written it off accordingly. This calculation works out at 1s. 10d. per day for the 10 horses.

*Interest on Value of Horses.*—Elevenpence represents 5 per cent. on £250 value of the horses spread over 275 days.

*Keep of Horses.*—I have assumed a working horse to consume 40lbs. of chaff per day, at £5 a ton. This represents 17s. 10d. per day for the 10 horses.

*Depreciation and Interest on Plough.*—The five-furrow plough is worth £67 10s., which, when written off in 10 years and spread over 70 days, represents 1s. 11d. per day's work. Similarly 5 per cent. interest on £67 10s. represents 1s. per working day.

*Depreciation on Harness and Swings.*—In this connection 4d. per day is reckoned fair.

*Driver's Wages.*—The minimum wage of 12s. 6d. has been adopted.

#### COMPARISON BETWEEN TEAM AND TRACTOR WORK.

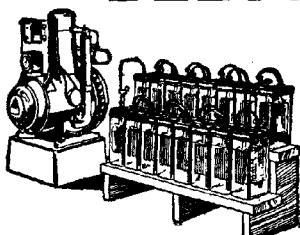
In the first place, a one month's trial of continuous work under official supervision has shown that the "Fordson" tractor, apart from a little awkwardness in the finishing off of headlands, can do the work of a 10-horse team in favorable weather conditions. How the tractor would have fared under unfavorable weather conditions we are unable to judge. It must not, however, be implied that by this is meant that the "Fordson" tractor can do the work of 10 horses in any and every circumstance. The tractor has greater pace than an ordinary horse team, and has, therefore, been able to cover more ground in the same time. In these trials a three-furrow, cutting a width of 25½in., was able to keep up with a five-furrow cutting 40in.; and the relative speeds may roughly be said to be in inverse proportion to these figures. Whether, however, the tractor would be able to compete with 10 horses in operations in which speed was of less consequence we are unable to say.

When, however, we turn to the question of costs, the local position of the tractor seems almost hopeless at present prices, and, so far as can be seen, at any prices that can be anticipated in the near future. Costs of 8s. 10d. per acre for the team as against 16s. 4d. for the tractor are very difficult to get over. In this connection the disabilities of the tractors can be summarised as follows:—

1. Its greater capital cost—£425 as against £250—involving higher interest charges.
2. The necessity of writing off this capital in a shorter term of years—five years as against 10 years.
3. The costliness of oil and fuel relative to the feed requirements of horses—8s. 7d. per acre as against 4s. 2d.
4. The question of breakdowns and repairs, and the unavoidable losses of time which they involve, a very capital matter in agricultural operations, most of which are dependent on fleeting favorable weather conditions.
5. The necessity of employing experienced drivers, and consequently costly ones, in order to secure satisfactory results.

As against these disadvantages it is urged that the tractor costs nothing when not actually at work, whilst horses must be fed. In my view there is comparatively little in this argument: the longer the period of idleness the greater the proportion for interest and depreciation to be borne by actual working days. Moreover, on a well conducted farm the out-of-work days of a horse are comparatively limited. In these calculations I have assumed them to be represented by 90 days, which on the whole I am inclined to look upon as above the average. Over much of this time idle horses are turned out to graze, and the cost of their upkeep cannot be reckoned at more than 2s. a week; and when partly handfed they would not require more than half a working ration, with a little grazing thrown in. On this basis the upkeep of a horse when out of work is not likely to exceed £2 10s. per annum, or

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£25 for the 10 horses. If this sum be distributed over the 275 working days of these 10 horses, it works out to about 1s. 10d. per diem, or a little over 5d. per acre, which additional sum cannot be said to modify the cost of ploughing very appreciably in favor of the tractor.

It will, of course, be said that the tractor can, in good hands, work more than eight hours a day: this, no doubt, is a fact; but whether it can do so continuously throughout the ploughing season is quite another matter. The fact that under favorable weather conditions the tractor cannot work as readily as horses, will probably serve to neutralise the longer working hours of fine weather. Interruptions from breakages and accidents must also be taken into consideration in any average of working hours. In this connection it may be stated that on two separate days we asked the "Fordson" to do the maximum work it could do: the results were as follows:—

July 14th . . . . .	6.24 acres in 8hrs. 15min.
July 30th . . . . .	6.43 acres in 10hrs. 15min.

	12.67 acres in 18hrs. 30min.
Mean . . . . .	6.33 acres in 9hrs. 15min.
	or 0.68 acres per hour.

Hence in these maxima tests, an average of 6.33 acres was ploughed in a day of 9 hrs. 15 min., representing an average rate of 0.68 acres per hour. We have already seen that the mean rate of work was 0.54 acres per hour for the whole month; and it follows that an exceptionally good run was secured for these two days. In ordinary circumstances we could not depend on more than an average of 0.54 acres per hour, *i.e.*, for a run of 9 hours 15 minutes a ploughed area of about five acres as against 4.32 acres. Under these circumstances, the cost of ploughing would be slightly reduced if the driver's wages continue the same. It is, however, highly doubtful whether in ordinary circumstances an average in excess of eight hours a day could be successfully maintained throughout the season.

#### BATES' STEEL MULE.

It is somewhat regrettable to have to state that this tractor proved a complete failure at the trial, mainly, I believe, because the capital error was made of entering it for competition in a faulty state of repair. The tractor broke down repeatedly and much time was wasted in repairs, which might easily have been avoided.

The tractor was in the field between the 3rd and 28th of July, inclusively, representing 21 working days. During this period the area ploughed by a four-furrowed set-plough was 33.67 acres, that is to say, about 1.6 acres a day. Actually, however, during this period of 21 days, the tractor spent 58 hours only in work, and the balance, or 110 hours in idleness.

The cost of the fuel (petrol and kerosine) was £11 6s. and of the lubricants £2 18s. 9d., making a total of £14 4s. 9d., and representing an average of 8s. 5d. per acre ploughed, corresponding very closely to similar costs of the "Fordson."

The manager reports that this tractor was in difficulties whenever the surface soil was at all slippery, and did not answer well to the steering wheel.

#### GENERAL CONCLUSIONS.

I am of the opinion that so far as we are concerned, the day of the tractor for agricultural work has not yet come; and the main obstacle is the relatively high cost at which the work has to be carried out. With a change in economic conditions, which cannot, however, be anticipated in the near future, it is of course possible that the tractor may ultimately come into its own. The example of its success in Great Britain during the course of the war is often quoted in support of its claims to present use. It should not be forgotten that in this particular case the economic conditions favored tractors in every way; horses were being requisitioned for war purposes, horse feed was scarce and costly, and in many circumstances unobtainable; and on top of all every legitimate effort was being put forward towards increasing the area under crop. In the circumstances, any form of power that could do agricultural work was naturally welcomed, and tractors apparently were not slow to fill the gap, and are reported to have done very creditable work. With the return to more normal conditions, the question of costs is bound to be more closely scrutinised, and in this State at all events, it would appear that as matters stand tractors cannot hope to compete successfully with horses.

In closing, I wish to express the indebtedness of the Department to the firms who were good enough to take part in these trials, and our appreciation of the very careful and painstaking way in which these trials were supervised by Mr. Waddy, the manager of the farm.

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## EXPERIMENTAL FARM HARVEST REPORTS.

### KYBYBOLITE EXPERIMENTAL FARM.

[By W. J. SPAFFORD, Superintendent Experimental Work, and  
L. S. DAVIE, Manager.]

This farm is situated in the hundred of Binnum, in the south-east of the State, and contains about 1,000 acres of land immediately surrounding the old Kybybolite Sheep Station. The land is more or less undulating, and is all arable; the great bulk of it contains a very large proportion of ironstone rubble, with its corresponding crop-raising difficulties, whilst the remaining portion is heavy-working "crabhole" land.

#### THE SEASON 1919.

The season proved not only a comparatively "dry" one for the district, but was peculiar in that it was very erratic from month to month: the average rainfall for Kybybolite starts low for January, gradually increases to June and July, then gradually lessens to December, and on the whole is a very regular rise and fall to and from

the middle months, but this did not prove so this year. January was almost rainless, but was followed by over 2½in. in February, then March gave 84 points, and April only 6 points. The low falls of March and April were not sufficient to moisten the soil enough to allow of proper preparation for seeding, and so many of the crops were put in later in the year than is wise. From the beginning of May until the end of October the rains were quite suitable for crops, but the small amount registered in November—29 points—was not enough to finish off the late-sown crops, with the result that the yields were erratic—good from early-sown crops and poor from those sown late.

The following table sets out in detail the rainfall obtained at the farm since 1906:—

*Rainfall Distribution at Kybybolite, 1906-1919.*

	Means, 1906- 1911.							Means, 1906- 1919.		
	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	In.	In.
January .....	0.36	—	0.30	0.72	0.54	1.29	0.45	0.29	0.16	0.42
February .....	1.01	0.14	1.77	0.15	1.15	0.28	2.81	0.23	2.35	1.07
March .....	1.89	0.72	1.38	1.37	0.42	0.03	1.17	0.27	0.84.	1.25
April .....	1.60	1.51	0.80	1.98	1.12	2.07	0.74	1.38	0.06	1.37
May .....	3.30	0.83	0.83	1.98	1.82	0.69	4.72	2.48	2.09	2.52
June .....	3.53	2.64	0.32	0.65	0.55	3.56	1.33	3.52	1.53	2.95
July .....	3.90	2.54	1.94	1.69	1.68	2.68	4.47	2.42	2.21	3.07
August .....	2.89	1.81	3.08	0.33	4.11	2.94	2.69	2.76	1.08	2.58
September .....	2.67	5.83	3.03	0.47	4.18	2.77	2.96	0.53	2.53	2.74
October .....	2.27	1.10	1.95	0.18	1.20	2.20	2.78	2.70	1.64	1.95
November .....	1.64	1.97	1.98	1.15	0.52	3.28	2.21	0.65	0.29	1.56
December .....	1.34	1.74	1.06	1.27	0.01	1.74	0.36	1.09	0.82	1.15
Total rainfall	26.41	20.83	18.44	11.94	23.30	23.53	26.69	18.32	15.60	22.65
Totals "Useful" rain (April-November)	21.80	18.23	13.93	8.43	21.18	20.19	21.90	16.44	11.43	18.74

#### DISTRIBUTION OF "USEFUL" RAINFALL.

The table below shows very clearly where the weaknesses of the rainfall were as regards crop growth; besides showing very low seeding and winter rains, it only shows 29 points for early summer rains—the rains which "finish" crops properly—when the average for this period is 1.56in.:—

*Distribution of "Useful" Rain—Kybybolite, 1919.*

	1919.	1906-1919.
	Inches.	Inches.
Seeding rains (April-May) .....	2.15	3.89
Winter rains (June-July) .....	3.74	6.02
Spring rains (August-October) .....	5.25	7.27
Early summer rains (November) .....	0.29	1.56
Total "useful" rain .....	11.43	18.74

## CROPS.

The whole farm is gradually being divided into sets of fields with the intention of testing various systems of rotation of crops, and as this is being done the proportion of the crops to be harvested is becoming less and less. Naturally, with the money available, this process of changing the whole method of working the farm, from one where harvested crops are the main item, to one where livestock raising will be the chief activity, is a slow one, and for some time to come the cereal crops must of necessity remain an important part of the farm work.

*Green Forage Crops.*—The natural winter feed is usually very poor at Kybybolite, and to overcome the shortage, mixtures of the cereals are always sown in the autumn, and in most years quite good grazing is the result.

Field No. 3 carried a crop of barley in 1918, was cultivated up soon after harvest, and between March 7th and 10th a mixture of 70lbs. oats and 50lbs. rye was drilled in with 1ewt. superphosphate to the acre. Field No. 10 was out as pasture in 1918, and on February 24th was drilled in with barley and 1ewt. superphosphate to the acre. Field No. 13 carried a pea crop in 1918, and between April 10th and 12th was seeded with 70lbs. oats and 50lbs. rye with 1ewt. superphosphate per acre.

*Peas.*—It is usual to grow a comparatively large area of peas each year at Kybybolite, but with only fair success, for although the crop usually makes good growth, the yield of grain is uncertain and often very disappointing. This season three fields carried crops of Early Dun field peas, and the yields secured were extremely low, and hardly worth harvesting.

*Yields of Peas—Kybybolite, 1919.*

Variety.	Field Grown.	Area.	Total Yield.	Yield	
				Acres.	Bush. lbs.
Early Dun . . . . .	No. 4	4.01	10 7	2	31
Early Dun . . . . .	20A	28.67	50 32	2	7
Early Dun . . . . .	16C	10.00	10 2	1	0
Farm average . . . . .	—	42.68	80 41	1	53

*Lucerne.*—Field No. 10B was sown last year with lucerne, and with the exception of a few small patches which were killed by the burning off received in the hot dry weather of the early summer a very good stand resulted. The summer rains were extremely light, yet quite fair growth was made by the crop, particularly so towards the end of the season.

*Linseed.*—At Kybybolite linseed plots were conducted this year, on land which carried cereal crops in 1918, and which was ploughed in February and worked down to a good seed bed. The seed was broad-

casted on to the plots on June 14th and immediately harrowed. The results, as set out below, were extremely poor:—

*Linseed at Kybybolite Experimental Farm, 1919.*

	Seed per	Super.	Area	Total	Yield per
	Acre.	phosphate		Yield.	Acre.
	lbs.	ewts.	Acres.	Bush. lbs.	Bush. lbs.
Plot 1 . . . . .	40	2	1.67	3 .15	1 54
Plot 2 . . . . .	50	2	1.67	4 34	2 42
Plot 3 . . . . .	60	2	1.67	3 32	2 8
Means . . . . .			5.01	11 25	2 16

The seeding of these plots was delayed until the middle of June owing to the persistence of weeds, which had to be eradicated before the seed could be put in. The germination was regular and good, and the crop made good, even growth, up to about 2ft. 6in. high, where it podded up really well, and had every appearance of producing a very fair yield of seed; but the final results, owing to the hot, dry weather setting in so early, were extremely poor.

*Wimmera Rye Grass* (*Lolium subulatum*).—A small block in Field No. 11A—about 1½ acres—was sown with Wimmera rye grass. This grass made quite fair growth, particularly so considering the dryness of the season, and so instead of grazing it the crop was left to ripen seed, to enable us to extend the area under it at the farm. Although the plants produced a nice showing of seed heads the dryness of the early summer did not favor a good setting of seed, and in consequence only 2bush. of seed were collected from the 1.52 acres of grass.

*Miscellaneous Fodders*.—Small blocks of land in Field No. 8B were sown with the following fodders:—Bokhara clover (1 acre), King Island melilot (.75 acre), Subterranean clover (.3 acre), Alsike clover (.3 acre), White Dutch Clover (.3 acre), Cocksfoot (.3 acre), and Strawberry clover (.1 acre). These all germinated well, but in no case did anything but poor growth result from any of them.

*Hay Crops*.—The amount of hay necessary at this farm is getting greater and greater as the livestock interests increase, and this year over 200 tons were cut and stacked. As we have a weighbridge, weights are kept of all hay cut. This puts us in the position of being able to record correctly the yields secured from all types of hay grown.

*Wheaten Hay*.—All told 50.59 acres of wheat crops were cut for hay from four different fields, and produced 55 tons 2ewts. 84lbs. of hay. No land is bare fallowed, as we understand the term in our typical cereal-growing districts, and the rest the land gets is to leave it out as pasture now and again. This year the wheaten hay was grown in Field 20E, which carried a pea crop in 1918; Field 20, which carried kale in 1917 and 1918; Field 17, which grew oats in 1918; and

Field 16B, which carried a crop of hay in 1918. The returns secured from these fields are shown next:—

*Wheaten Hay Yields, Kybybolite, 1919.*

Crop.	Field Grown.	Area. Acres.	Yield.		Yield per Acre.		
			Tons cwt.s.	lbs.	Tons	cwt.s.	lbs.
Queen Fan . . . . .	No. 20E	9.04	22	5 56	2	9	31
Yandilla King . . . . .	No. 20	6.65	4	19 0	0	14	99
Zealand Blue . . . . .	No. 20	5.47	3	18 14	0	14	31
White Tuscan . . . . .	No. 20	15.64	10	14 14	0	13	77
Headlands . . . . .	No. 17	3.79	1	16 42	0	9	67
White Tuscan (exp.) . . .	No. 16B	10.00	11	9 70	1	2	108
Farm average . . . . .	—	50.59	55	2 84	1	1	89

The very extreme difference in the yield of hay secured from Field 20E, when compared to the other fields, appears to be largely due to the fact that this field was "ridge" ploughed, i.e., the land was ploughed in very narrow strips, so that there were only two drill widths between the ridges. The effect of having open furrows only about 18ft. apart, has been very marked for the couple of seasons in which it has been tried, so much so that it is now the intention of ploughing all of the "wet" fields of the farm on this "ridge" system.

*Oaten Hay.*—The oat crops cut for hay were grown in a number of different fields, as follows:—Field 9A, after wheat in 1918; Field 14, after wheat in 1918; Field 15, which was left as pasture in 1918; Field 16, grew a crop of sorghum in 1918; and Field 20B, after kale in 1918. The total area cut was 80.82 acres, which yielded 126 tons 4cwt.s. 42lbs., and details of the returns are set out below:—

*Oaten Hay Fields, Kybybolite, 1919.*

Crop.	Field Grown.	Area. Acres.	Total Yield.		Yield per acre.		
			Tons	cwt.s.	Tons	cwt.s.	lbs.
White Liggowo . . . . .	No. 15	6.21	15	7 28	2	9	53
Calcutta . . . . .	No. 15	16.48	40	10 0	2	9	17
Algerian . . . . .	No. 20B	8.92	17	0 84	1	18	22
Algerian . . . . .	No. 16	10.10	14	2 84	1	7	111
Algerian (with Phalaris Minor) . . . . .	No. 15	5.27	7	6 84	1	7	95
Calcutta (autumn ploughing)	No. 15	14.70	18	5 98	1	4	100
Royal Cluster . . . . .	No. 15	1.13	1	5 28	1	2	39
Clydesdale . . . . .	No. 15	6.76	7	1 14	1	0	98
Algerian (with Vetches) . .	No. 9A	1.94	1	0 42	0	10	56
Algerian . . . . .	No. 15	5.04	2	9 42	0	9	89
Headlands . . . . .	No. 14	4.27	1	14 98	0	8	19
Farm average . . . . .	—	80.82	126	4 42	1	11	26

*Mixed Wheat and Oats for Hay.*—Fields 8 and 8A, both of which carried a hay crop in 1918, were seeded with a mixture of Queen Fan wheat and Calcutta oats, the former receiving 60lbs. wheat and 35lbs. oats, and the other 80lbs. wheat and 55lbs. oats to the acre. The

returns secured as set out in next table show a fair increase of hay per acre for the heavier seeding:—

*Mixed Wheat and Oat Hay Yields, Kybybolite, 1919.*

Crop.	Field Grown.	Area. Acres.	Total Yield.		Yield per Acre.	
			Tons cwt.s. lbs.	Tons cwt.s. lbs.	Tons cwt.s. lbs.	Tons cwt.s. lbs.
Wheat and oats . . . . .	No. 8	11.46	19 0 42	1 13 22		
Wheat and oats . . . . .	No. SA	5.94	10 19 70	1 16 109		
Farm average . . . . .	—	17.40	30 0 0	1 14 52		

The next two tables set out the total hay cut and the yield per acre, in the one case, and in the other the averages secured from the different types for the past two seasons:—

*Hay Yields, Kybybolite, 1919.*

Kind.	Area. Acres.	Total Yield.		Yield per Acre.	
		Tons cwt.s. lbs.	Tons cwt.s. lbs.	Tons cwt.s. lbs.	Tons cwt.s. lbs.
Wheat and oats . . . . .	17.40	30 0 0	1 14 52		
Oats . . . . .	80.82	126 4 42	1 11 26		
Wheat . . . . .	50.59	55 2 84	1 1 89		
Farm average . . . . .	148.81	211 7 14	1 8 45		

*Cereal Crops, Kybybolite, 1918-1919.*

Year.	Mixed Wheat						Farm Average.
	Oaten Hay. tons cwt.s. lbs.	and Oats. tons cwt.s. lbs.	Wheaten Hay. tons cwt.s. lbs.	Average. tons cwt.s. lbs.	Farm		
1918 . . . . .	1 4 97	0 16 106	1 5 30	1 2 58			
1919 . . . . .	1 11 26	1 14 52	1 1 89	1 8 45			
Means . . . . .	1 8 5	1 5 79	1 3 59	1 5 51			

Like most other crops at this farm, the returns secured from cereal hay vary between wide limits in different years, and, as the next table shows, these variations have been between 16cwt.s. per acre and 2½ tons since 1910. The average yield for the past 10 years has been 1 ton 6cwt.s. per acre, which, although not high, is certainly satisfactory for land not bare fallowed.

*Hay Returns, Kybybolite, 1910-1919.*

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield.		Yield per Acre. Tons cwt.s. lbs.
				Tons cwt.s. lbs.	Tons cwt.s. lbs.	
1910 . . . . .	28.35	21.08	106.13	88 19 28	0 16 85	
1911 . . . . .	22.23	14.72	94.04	136 6 110	1 9 28	
1912 . . . . .	20.83	18.23	26.59	67 7 70	2 10 76	
1913 . . . . .	18.44	13.93	108.55	166 11 0	1 10 77	
1914 . . . . .	11.94	8.43	109.00	90 1 0	0 16 59	
1915 . . . . .	23.30	21.18	108.66	111 14 56	1 0 65	
1916 . . . . .	23.53	20.19	77.35	135 1 0	1 14 102	
1917 . . . . .	26.69	21.90	96.77	49 9 0	0 10 25	
1918 . . . . .	18.32	16.44	152.85	172 1 70	1 2 58	
1919 . . . . .	15.60	11.43	148.81	211 7 14	1 8 45	
Means . . . . .	20.92	16.75	—	—	1 6 6	

*Oat Crop.*—The yields of grain secured from different varieties of oats vary considerably, and at times are really promising, and so quite

a fair number of varieties are tried each year in the hope of discovering a variety suitable to the peculiar crop-growing conditions of Kybybolite. This year oat crops were harvested from five fields, and the yields varied from almost 37bush. to just over 6½bush.

Field 4C, which carried crops of linseed, phalaris, and wheat in 1918, was ploughed during the first week in June, then immediately harrowed, and on June 7th was drilled in with 70lbs. Algerian oats and 1ewt. superphosphate to the acre.

Field 9C grew a crop of turnips in 1918, was ploughed on May 8th, skim ploughed on May 28th, harrowed on June 7th, and seeded with 60lbs. Algerian oats and 1ewt. superphosphate per acre on June 7th.

Field 14, which grew crops of hay and wheat in 1918, was ploughed between May 9th and June 11th, harrowed between June 7th and 12th, and varieties of oats were drilled in at the rate of 67lbs. of seed with 1cwt. superphosphate per acre between June 7th and 12th.

Field 15 was grazed during 1918, and was ploughed as opportunity offered between October 10th, 1918, and May 20th, 1919. Like the ploughing, cultivation was given to parts of the field at different times, and the whole was harrowed either just before the drill or just after it. Varieties of oats were drilled in at the rate of 70lbs. seed with 1ewt. superphosphate to the acre, between April 17th and May 22nd.

Field 20B carried a crop of kale in 1918, was "ridge" ploughed (ridges 18ft. apart) between April 25th and May 6th, immediately harrowed, seeded with 60lbs. Algerian oats and 1ewt. superphosphate per acre between May 6th and 8th, and again harrowed.

The returns from the varieties of oats grown in the above five fields are set out in the next table:—

*Oat Variety Yields, Kybybolite, 1919.*

Variety.	Field. Grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per acre. Bush. lbs.
Algerian . . . . .	No. 20B	16.43	604 19	36 32
Goldfinder . . . . .	No. 14	0.76	16 0	21 2
Sunrise . . . . .	No. 14	0.46	9 27	21 1
Calcutta (Sel. 4) . . . . .	No. 14	7.70	151 4	19 25
Conqueror . . . . .	No. 15	0.63	11 5	17 26
Algerian . . . . .	No. 4C	4.04	69 3	17 4
Dillon . . . . .	No. 15	0.15	2 21	16 33
Burpee Welcome . . . . .	No. 15	0.95	14 21	15 12
White Liggowo . . . . .	No. 14	1.09	16 8	14 35
Golden Rain . . . . .	No. 15	0.70	10 15	14 33
Algerian (Sel. 3) . . . . .	No. 14	9.69	141 21	14 24
Algerian . . . . .	No. 9C	1.94	26 2	13 17
Calcutta (Sel. 5) . . . . .	No. 14	2.99	36 33	12 13
Algerian Tartar. . . . .	No. 14	1.63	19 27	12 3
Clydesdale (Sel. 4) . . . . .	No. 14	1.07	8 35	8 12
Clydesdale (Sel. 5) . . . . .	No. 14	0.27	1 32	6 27
Mixed varieties . . . . .	No. 15	0.27	5 1	18 24
Farm average . . . . .	—	50.77	1,144 34	22 22

The very satisfactory yield of 36bush. 32lbs. per acre, as secured from the oat crop in Field 20B, appears to be largely due to the fact that this field was "ridge" ploughed, and on the results so far secured from this method of soil preparation, it now appears quite possible to produce good yields from cereal crops instead of the poor ones which have been the rule in the past.

The next table shows in detail the returns of all oat crops grown at the farm since 1910, with the average yield for the period:—

*Oat Returns, Kybybolite, 1910-1919.*

Year.	Total Rainfall.		Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
	In.	"Useful" In.			
1910	28.35	21.08	77.00	1,001 0	13 0
1911	22.23	14.72	60.91	828 13	13 24
1912	20.83	18.23	103.00	3,450 36	33 20
1913	18.44	13.98	94.55	1,460 10	15 18
1914	11.94	8.43	6.00	61 3	10 7
1915	23.30	21.18	79.74	1,251 25	15 28
1916	23.53	20.19	61.94	1,388 39	22 17
1917	26.69	21.90	20.66	154 13	7 19
1918	18.32	16.44	36.93	554 25	15 1
1919	15.60	11.43	50.77	1,144 34	22 22
Means	20.92	16.75	—	—	16 36

With an average annual rainfall of 21in., of which 16 $\frac{1}{2}$ in. has fallen in the growing period, a yield of about 17bush. of oats per acre is extremely low, and but for the chance of "ridge" ploughing tending considerably to increase this average yield, the area under this crop should be reduced.

The yields from different varieties which have been grown for the past three seasons have varied very considerably, as is to be seen in the table below:—

*Yields of Oat Varieties, Kybybolite, 1917-1919.*

	Yield per acre				Means 1917-1919. Bush. lbs.
	1917. Bush. lbs.	1918. Bush. lbs.	1919. Bush. lbs.	1917-1919. Bush. lbs.	
Calcutta	12 15	16 36	17 23	15 25	
Algerian	4 6	15 2	26 8	15 5	
White Liggow	5 25	18 9	14 35	12 36	
Goldfinder	2 35	11 38	21 2	11 38	
Dillon	4 20	11 27	16 33	11 0	
Clydesdale	5 23	18 23	7 39	10 28	
Burpee Weleome	5 28	10 35	15 12	10 25	
Golden Rain	3 30	12 7	14 33	10 10	
Conqueror	2 3	7 0	17 26	8 36	
Sunrise	1 31	3 30	21 1	8 34	
Algerian Tartar	2 20	9 5	12 3	7 36	
Farm average	7 19	15 1	22 22	15 1	
	Inches.	Inches.	Inches.	Inches.	
Total rainfall	26.69	18.32	15.60	20.20	
"Useful" rainfall	21.90	16.44	11.43	16.59	

*Barley Crops.*—Barley has been a very poor crop at Kybybolite, and since 1910 has only once given a fair return, which was 30bush. per acre in 1912. This year only one variety was grown—Short Head—and that one in two fields. Field 6 carried wheaten hay in 1918, was ploughed between June 27th and July 4th, cultivated between July 29th and August 8th, seeded with 70lbs. barley and 1ewt. superphosphate per acre between August 4th and 9th, and immediately harrowed.

Field 6A grew a wheat crop in 1918, was ploughed between July 14th and 15th, harrowed immediately in front of drill, seeded with 70lbs. barley and 1ewt. superphosphate per acre on August 2nd, and again harrowed. From the two fields 39.71 acres were harvested for 650bush. 1lb. of grain, or an average return of 16bush. 19lbs. per acre.

The next table shows the behavior of the barley crops at Kybybolite since 1910:—

*Barley Returns, Kybybolite, 1910-1919.*

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1910 . . . . .	28.35	21.08	45.39	299 29	6 30
1911 . . . . .	22.23	14.72	55.76	552 16	9 20
1912 . . . . .	20.83	18.23	50.00	1,500 0	30 0
1913 . . . . .	18.44	13.93	35.00	527 0	15 3
1914 . . . . .	11.94	8.43	3.02	37 48	12 29
1915 . . . . .	23.30	21.18	50.28	789 39	15 35
1916 . . . . .	23.53	20.19	43.24	273 37	6 17
1917 . . . . .	26.69	21.90	66.31	304 41	4 30
1918 . . . . .	18.32	16.44	35.08	266 48	7 31
1919 . . . . .	15.60	11.43	39.71	650 1	16 19
Means . . . . .	20.92	16.75	—	—	12 21

*Rye Crops.*—Even though the grain yields of rye are very low at the farm, it pays to grow our own seed for green forage crops, and at the same time to have good thatching straw always fresh. The yields received from the crop since 1914 are set out in the next table:—

*Rye Returns, Kybybolite, 1914-1919.*

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1914 . . . . .	11.94	8.43	6.00	90 16	15 3
1915 . . . . .	23.30	21.18	7.27	57 44	7 48
1916 . . . . .	23.53	20.19	8.20	35 3	4 14
1917 . . . . .	26.69	21.90	—	Failure	
1918 . . . . .	18.32	16.44	4.62	52 0	11 15
1919 . . . . .	15.60	11.43	7.23	37 7	5 8
Means . . . . .	19.90	16.59	—	—	7 15

*Wheat Crops.*—As the area put under cereal crops is being reduced gradually at this farm, many of the wheat varieties which have been grown in the past have been dropped, and this season only nine kinds were grown in field plots, but even with so few varieties, five fields were sown with wheat for grain.

Field 4A was grazed during 1918, was ploughed during February 22nd and 23rd, cultivated April 2nd and May 20th, seeded on May 31st with 80lbs. White Tuscan wheat and 1cwt. superphosphate per acre, and immediately harrowed.

Field 6B carried maize in 1918, was skim-ploughed on February 10th, cultivated April 3rd and 4th, and on June 13th seeded with varieties at the rate of 80lbs. seed with 1cwt. superphosphate per acre, and then harrowed.

Field 9F was grazed in 1918, ploughed on May 27th, cultivated May 30th, and on same day was seeded with 80lbs. Federation and 1cwt. superphosphate per acre, after having been limed at the rate of 1 ton per acre; the harrows were then run over the land.

Field 17 carried oats in 1918, about one-third ploughed by April 11th, the remainder between June 4th and 6th, cultivated by June 6th, seeded with varieties at the rate of 80lbs. seed with 1cwt. superphosphate per acre, and then harrowed.

Field 20E, which carried peas in 1918, was "ridge" ploughed (ridges 18ft. apart) between May 21st and 30th, seeded with 80lbs. Queen Fan wheat and 1cwt. superphosphate per acre between May 28th and 30th, and then harrowed.

The yields obtained from the varieties grown in the above fields are to be seen below:—

*Wheat Variety Yields, Kybybolite, 1919.*

Variety.	Field. Grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per acre. Bush. lbs.
Queen Fan . . . . .	No. 20E	19.60	608 50	31 4
White Tuscan . . . . .	No. 4A	5.05	148 37	29 26
Federation (Sel. 5) . . . . .	No. 17	1.80	21 21	11 52
Federation . . . . .	No. 9F	1.12	12 40	11 9
White Tuscan (Sel. 5) . . . . .	No. 17	4.20	41 10	9 48
White Tuscan (Sel. 4) . . . . .	No. 17	7.24	70 13	9 42
Crossbred 53 . . . . .	No. 17	5.83	50 31	8 40
Yandilla King (Sel. 5) . . . . .	No. 17	4.38	37 24	8 32
Davies . . . . .	No. 6B	0.92	7 31	8 10
Federation (Sel. 4) . . . . .	No. 17	10.42	83 15	7 59
Queen Fan (Sel. 3) . . . . .	No. 17	3.85	30 4	7 49
Glencope . . . . .	No. 6B	0.78	5 36	7 11
Yandilla King (Sel. 4) . . . . .	No. 17	3.33	23 10	6 57
Marquis . . . . .	No. 6B	0.94	6 19	6 43
Basil . . . . .	No. 6B	1.65	10 8	6 8
White Tuscan . . . . .	Exp.	2.68	28 8	10 30
Mixture (Headlands) . . . . .	No. 6B	1.16	5 53	5 4
Farm average . . . . .	—	78.26	1,190 50	15 13

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**SEPTEMBER 14th, AT SECRETARY'S OFFICE.**

The average yield of all wheats grown of 15bush. 13lbs. per acre is only fair, and but for the good returns secured from Fields 20E and 4A, would have been extremely poor. Field 20E was "ridge" ploughed, which seems to account for the high yield; and although not "ridged," Field 4A is the most fertile field on the farm, being very well drained naturally, and having been well supplied with farmyard manure some few years ago. The inclusion of this harvest in the farm average since 1910 brings it up to 14bush. 33lbs., as can be seen below:—

*Wheat Returns, Kybybolite, 1910-1919.*

Year.	Total Rainfall.		"Useful"		Yield	
	In.	In.	Area.	Bush. lbs.	Per Acre.	Bush. lbs.
1910 . . . . .	28.35	21.08	15.00	79 43	5 19	
1911 . . . . .	22.23	14.72	17.15	232 45	13 34	
1912 . . . . .	20.83	18.23	81.91	1,876 35	22 54	
1913 . . . . .	18.44	13.93	48.20	1,288 56	26 44	
1914 . . . . .	11.94	8.43	22.17	238 32	10 46	
1915 . . . . .	23.30	21.18	79.64	882 31	11 5	
1916 . . . . .	23.53	20.19	98.75	1,875 19	18 59	
1917 . . . . .	26.69	21.90	70.46	231 29	3 26	
1918 . . . . .	18.32	16.44	58.52	1,027 40	17 34	
1919 . . . . .	15.60	11.43	78.26	1,190 50	15 13	
Means . . . . .	20.92	16.75	—	—	14 33	

In the next table is set out the past history of the wheat varieties which have been grown at Kybybolite in previous years as well as this year. Here it will be seen that the two wheats, Queen Fan and White Tuscan, are the only outstanding ones in these particular conditions, most others being below the average for the farm.

*Yields of Wheat Varieties, Kybybolite, 1912-1919.*

Variety.	Means								Means	
	1912-				1915-				1912-	1915-
	1914.	1915.	1916.	1917.	1918.	1919.	1919.	1919.		
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
White Tuscan . . .	24 57	11 16	24 5	4 20	19 21	15 2	18 37	14 49		
Federation . . . .	23 5	12 13	20 25	3 45	20 5	8 47	16 49	13 3		
Yandilla King . . .	19 41	6 13	27 2	2 46	22 34	7 51	15 41	13 17		
Queen Fan . . . .	*18 43	17 43	21 10	3 17	20 41	27 15	—	18 1		
Marquis . . . . .	—	11 10	26 13	1 17	13 53	6 43	—	11 51		
Crossbred 53 . . .	*1 4	6 52	26 54	4 26	12 15	8 40	—	11 49		
Davies . . . . .	—	—	—	3 43	22 57	8 10	—	—		
Basil . . . . .	—	—	—	—	20 0	6 8	—	—		
Glenope . . . . .	—	—	—	—	—	7 11	—	—		
Farm average . . .	20 8	11 5	18 59	3 26	17 34	15 13	15 50	13 15		
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
Total rainfall . . .	17.07	23.30	23.53	26.69	18.32	15.60	19.83	21.49		
"Useful" rainfall .	13.53	21.18	20.19	21.90	16.44	11.43	16.47	18.23		

\* 1914 only.

(To be continued.)

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, August 4th, there being present Mr. C. J. Tuckwell (Chairman), the Director of Agriculture (Professor Arthur J. Perkins), the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch), Captain S. A. White, Messrs. T. H. Williams, F. Coleman, W. S. Kelly, H. Wicks, and the Acting Secretary (Mr. H. J. Finnis).

*Destruction of Boxthorn.*—The matter of the destruction of boxthorn was again brought before the Board, and the Secretary was instructed to communicate with the Branches of the Bureau with a view of ascertaining if boxthorn was growing in the various districts, and if so, what steps had been taken for the eradication of the plants.

*Losses of Live Stock on Railways.*—Further consideration was given to the resolution carried at the recent Conference of Lower Northern Branches of the Agricultural Bureau complaining of the losses of live stock caused through the negligence of drivers when shunting shock trains. It was decided to communicate with the Society for the Prevention of Cruelty to Animals.

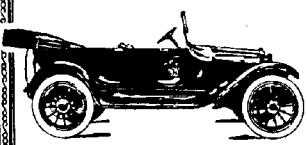
*Removal of Restrictions on Sale of Butter.*—At the recent conference of River Murray Branches of the Agricultural Bureau a resolution was carried asking that the restrictions on the marketing and sale of butter might be removed. The matter was referred to the Dairy Expert (Mr. P. H. Suter), who furnished the following report:—"I would respectfully point out that the price fixing will lapse on August 1st. With regard to the matter of marketing, I would say that the efforts of the two delegates sent to England by the Commonwealth to approach the Food Administration to release dairy produce and give an open market, were unsuccessful, but the delegates thought it advisable to make another contract, which they did, at a very satisfactory figure, viz., 240s. per cwt. for all Australian surplus butter going 90 points on grade, and for every one point over an extra 1s. up to 95 points. The future marketing of butter will, I feel sure, be satisfactory to the dairy folk."

*New Branch.*—Approval was given for the formation of a Branch of the Agricultural Bureau at Alawoona, with the following gentlemen as foundation members:—Messrs. S. and B. Finey, T. and W. Dart, O. Watkins, W. and C. Paull, E. J. Smith, F. E. Holland, T. D. Willison, G. Williams, J. Whitehead, H. Blackford, W. and A. C. Patterson, F. A. Lovegrove, C. Tiller, and G. O'Connor.

*New Members.*—Approval was given for the addition of the following names to the rolls of existing Branches:—Cleve—F. W. Smallcombe, P. J. Smallcombe, E. Lawson, A. V. Preisse; Elbow Hill—L. Pearce; Moreland—A. R. Lang; Port Elliot—R. Scott, A. N. Taylor; Wilkawatt—D. F. Bowman, J. W. Priess, A. W. Bates, C. R. Priess, T. J. Bates, J. Lillecrapp, E. W. Brooker, E. A. Altus, W. H.

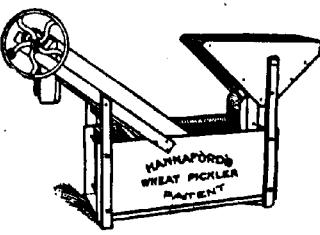
Phillips, W. J. Bowman, F. R. Koch; Brentwood—J. H. Boundy; Brinkley—H. Pearson, R. H. Lemmey, P. J. Humphrey, E. Wilhelm; Saddleworth (Ladies)—Mesdames J. Kelly, T. A. Newmann, L. Melville, F. W. Morcom, H. Roberts, G. Crawford, J. Fisk, E. Garrett, — Fraser, G. Friebe, H. Woollacott, H. Bannear, L. Baldwin, — Graham, L. Sandercock, F. Coleman, — Leach, Miss Fraser, Mesdames B. H. Jungfer, L. B. Howie, L. Hayes, James Bradley, John Bradley, M. Harris, A. E. Tucker, F. J. Judd; Kimba—J. Hannan, F. Freeth, J. R. Hogan, J. H. Sampson, T. Hansen; Mindarie—W. Hollow, J. Donovan; Mount Barker—R. Mooney, R. Mooney, jun., J. Clancy, L. Anderson, W. A. Mueller, R. J. Martin; Lone Gum—W. R. Henwood, K. Dunk, N. Dyer, jun.; Strathalbyn—A. Allen, R. Butt, S. Saunders, F. Thring, J. J. Brown; Cummins—A. G. Dick, R. L. Provis, W. J. Gumley, R. T. Hoske, W. Blucher, A. C. Fuss, W. J. Black, P. D. S. Cooper; Lake Wangary—B. Adamson, J. M. Shepperd; Kilkerran—G. Whitelaw, F. Francis, R. Wakefield; Dowlingville—J. H. Rowntree; Laura—M. Burgess, C. Amey, E. P. Cavanagh; Moorak—H. S. Farrant, J. Bowen; Clare—V. Maker, H. Walden, C. Hicks, — Doorne; Inman Valley—H. Weyland; Gawler River—F. Sandford.

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## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF AUGUST.

The following reports on the general Agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

*Booborowie*.—Weather—On the whole the weather has been unique from the point of view of suitability for plant growth, and has not been very cold. The rain fell regularly throughout in suitable quantities; 344 points of rain was registered for the month. Crops.—These are now showing signs of rapid growth during the last few days, and there should be some very heavy yields of both grain and hay in this locality. Natural feed is now moving on in growth. Stock—Some are in very poor condition, more particularly where not hand fed. Pests—Rabbits are again becoming very noticeable, and if they are not destroyed will be fairly numerous in the summer months. Miscellaneous—Fallowing is practically finished. Shearing is approaching full strength.

*Eyra's Peninsula*.—Weather for the month has been typical. Two and a half inches of rain has been recorded, which is equal to the average. Our total for the year is now 12in., an inch above the average for the period. Several frosts have been recorded and quite a number of warm, drying winds. Crops are growing splendidly, and are well advanced, some of the early sown early wheats are breaking into ear. Natural feed is growing well, and is quite plentiful for spare stock.

*Veitch*.—Weather—Veitch gauge has registered 209 points of rain for the month, the average for August is 153 points. Weather conditions generally have been good for crops and feed. Crops—All cereals are showing forward growth, except in fields that have been fed off with livestock. Natural Feed—A little natural feed is now showing and is making quick growth. Stock—Livestock are all improving, especially young horses. Miscellaneous—Fallowing operations are nearing a finish on some farms.

*Turretfield*.—The weather during this month was very seasonable; nice rains have fallen on 21 days during the month, and a total of 2.90in. has been registered. Some severe frosts have been experienced. Crops—Wheat crops are making nice growth, although in some places they are rather yellow in color. There is every appearance of a good heavy yield next year. Soursobs are thick in some of the crops. Natural feed is beginning to make some headway, and should be plentiful when the weather warms up. Stock is improving a little in condition, and will look much better when they lose their rough coats of hair. Miscellaneous.—Fallowing is nearly finished, and a large area is laid out as fallow. Hay carting to the chaffmills has been going on steadily, and the supply of stacked hay is getting low.

# HIGHEST HONORS FOR EFFICIENCY.

" Commonwealth "	.....	" Union " Brand Cement
" Gisko "	.....	Rabbit Poison
" Hick's "	.....	" Ideal " Poison Carts
" Hurst's "	.....	Wool Bale Fasteners
" Destruo "	.....	Fly Traps
" I.X.L."	.....	Rabbit Poison
" Jumbuck "	.....	Sheep Branding Fluids
" E.R.B."	.....	Crutching Outfits
" Koerstz "	.....	Wool Presses
" Quibell's "	.....	Liquid and Powder Sheep Dips
" Wolseley "	.....	Sheep Shearing Machinery
" Kerol "	.....	Disinfectant
" Torfol "	.....	Sanitary Paint
" Prophylactic "	.....	Sheep Lick

STOCKS OF ALL LINES OF STATION REQUISITES  
ON HAND AND TO ARRIVE.

**DALGETY AND COMPANY, LIMITED**  
CURRIE STREET, ADELAIDE,  
AND ALL BRANCHES.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on September 1st:—

**BUTTER.**—The season continues to develop satisfactorily for the dairying interests, and with further rains during the month of August the outlook is extremely bright. The sale price of Australia's surplus to the Imperial Government has just been reviewed, and the contract fixed on a basis of 27s. per cwt. for 90 points, with 1s. 6d. per point per cwt. up and down. The local market, therefore, at the close of August firmed to a parity with London, selling at 2s. 6½d. per lb. for first grade, in prints. As separator, dairy, and store butters will also participate in this sale they also firmed in sympathy, best separators and dairies selling at 2s. 4½d. to 2s. 5½d.; fair quality, 2s. 3d. to 2s. 4d.; store and collectors', 2s. 1d. to 2s. 2d. per lb.

**Eggs.**—Supplies have shown a considerable shortage as compared with the same time last year. No doubt the high cost of wheat has compelled breeders and others to dispose of their birds, while as heavy buying orders for eggs have already been placed on this market, high rates are sure to rule this season. Present quotations:—Hen, 1s. 9d.; duck, 1s. 10d. per dozen.

**CHEESE.**—Local cheese is very scarce, and importations are coming along to cope with the trade. Prices have advanced, sales being made up to 1s. 4½d. per lb.

**HONEY.**—continues very short, last season's take being practically cleared. Buyers are offering 8½d. for prime clear samples; second grades, 6d. to 6½d.; beeswax very saleable at 2s. per lb.

**ALMONDS.**—There is no alteration to report in this line. Fair quantities have been placed on this market, and sales have been effected at:—Brandis, 10½d.; mixed softshells, 9d. to 9½d.; hardshells, 6d. to 6½d.; kernels, 2s. 4d. per lb.

**BACON.**—Owing to the shortage in the live market, prices have firmed considerably, and in consequence bacon is selling at higher rates, but the advance has not interfered with the sale. Best factory cured sides, 1s. 7d. to 1s. 7½d.; middles, 1s. 8½d.; hams, 1s. 9d. per lb.

**LIVE POULTRY.**—Supplies throughout the month have not been equal to trade wants, so that competition has been most keen, and very tall figures have been secured. Therefore farmers would be wise in sending on their surplus birds in view of the good prices now ruling. Heavy-weight table roosters, 6s. to 7s. 9d. each; nice conditioned cockerels, 4s. 6d. to 5s. 11d.; plump hens, 4s. 6d. to 5s. 9d.; light birds, 3s. 8d. to 4s. 5d. (one pen lower); ducks, 4s. 6d. to 6s.; geese, 7s. to 8s. 6d.; pigeons, 1s. to 1s. 1d.; turkeys, from 1s. 4½d. to 1s. 10d. per lb. live weight for good to prime table birds.

**POTATOES.**—Since our last report the market has again fluctuated considerably, and as supplies from the South-Eastern districts of our State are about cleared, practically the whole of the requirements have been arriving from Victoria. The market there is much easier than it was a few weeks back, and the high prices which were realised last year do not seem likely to be repeated. **ONIONS.**—These are very short of supply, with the result that market is very firm. Quotations.—Potatoes, £15 10s. to £16 10s. per ton on rails Mile End or Port Adelaide. Onions, £18 to £21 per ton on rails Mile End or Port Adelaide.

## SANDFORD'S THREE BIG MONEY SAVERS

*Every Farmer, Dairyman, and Power User should see Sandford's Three Big Money-Saving Propositions before purchasing elsewhere. There is no doubt that the "Alfa Laval" Separator, "L.K.G." Milking Machine, and the "Lauson" Engine will double your profits in less than 12 months. Will you let us demonstrate to you.*



### THE KING OF SEPARATORS, "ALFA LAVAL."

The difference in the cost of an "Alfa Laval" from the cheaper makes of separators is made up in a few weeks by the extra cream you get by using the most dependable separator selling in Australia. More cream produces more butter; better butter demands bigger prices. Let your choice be an "Alfa." We will buy your old machine if you wish.

### THE "L.K.G." MILKING MACHINE

has many imitators, but leading dairymen have proved that no other machine will give equal results.

BECAUSE—The "L.K.G." will milk all your cows without moving them from one stall to another. The "L.K.G." has been worked consistently for eleven years on some of the best dairies in South Australia. The "L.K.G." is the only machine which has an absolute release, and this is so necessary in order to get a perfect milking. The "L.K.G." will milk perfectly right through the season.

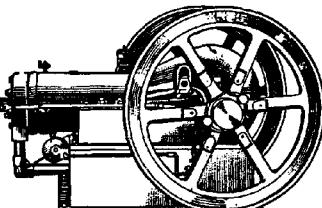
### DON'T BE MISLED.

THE "L.K.G." IS THE ONLY MACHINE THAT EMBODIES THE RIGHT PRINCIPLE, AND HAS STOOD THE TEST OF YEARS.

### "LAUSON" PETROL AND OIL ENGINES

A marvel of construction, inexpensive, and simple to understand. It cuts down your labor bill, and pays for itself quicker than you'd think possible. No power user should be without one. Send to-day for information; it's posted free.

100 % EFFICIENCY.



**A. W. SANDFORD & Co., Ltd.,**  
SOLE AGENTS.  
**GRENFELL STREET**      **ADELAIDE.**

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

### CONFERENCE AT STRATHALBYN.

The second annual Conference of Southern Branches of the Agricultural Bureau was held at Strathalbyn on Friday, August 27th. The Department of Agriculture was represented by the Hon. T. Pascoe, M.L.C. (Minister of Agriculture), Capt. S. A. White, C.M.B.O.U., Professor Arthur J. Perkins (Director of Agriculture), Mr. P. H. Suter (Dairy Expert), and Mr. H. J. Finn (Acting Secretary Advisory Board). Mr. S. Botterill, of the Strathalbyn Branch, occupied the chair, and extended a welcome to the visitors. The Mayor of Strathalbyn (Mr. J. W. Elliott) also spoke words of welcome, after which the Minister of Agriculture addressed the gathering. Mr. Pascoe referred to the development of the Agricultural Bureau system during recent years, and dwelt on the advantages of the institution to the farmers of South Australia.

The Bulk Handling of Wheat was discussed at length, the subject being introduced in a paper by Mr. Sowerby, of the Hartley Branch, in which the writer of the paper strongly advocated the adoption of the system.

Mr. D. M. Goldsworthy (Milang Branch) contributed a paper dealing with forage crops, which awakened considerable interest amongst delegates. This was followed by an address by the Government Dairy Expert (Mr. P. H. Suter). In the evening papers dealing with "The Utilisation of Scrub Lands," by Mr. H. B. Welch (Port Elliot), and "The Vine and Fruit Industry," by Mr. W. Hargreaves, of the same Branch, received consideration.

### AFFORESTATION.

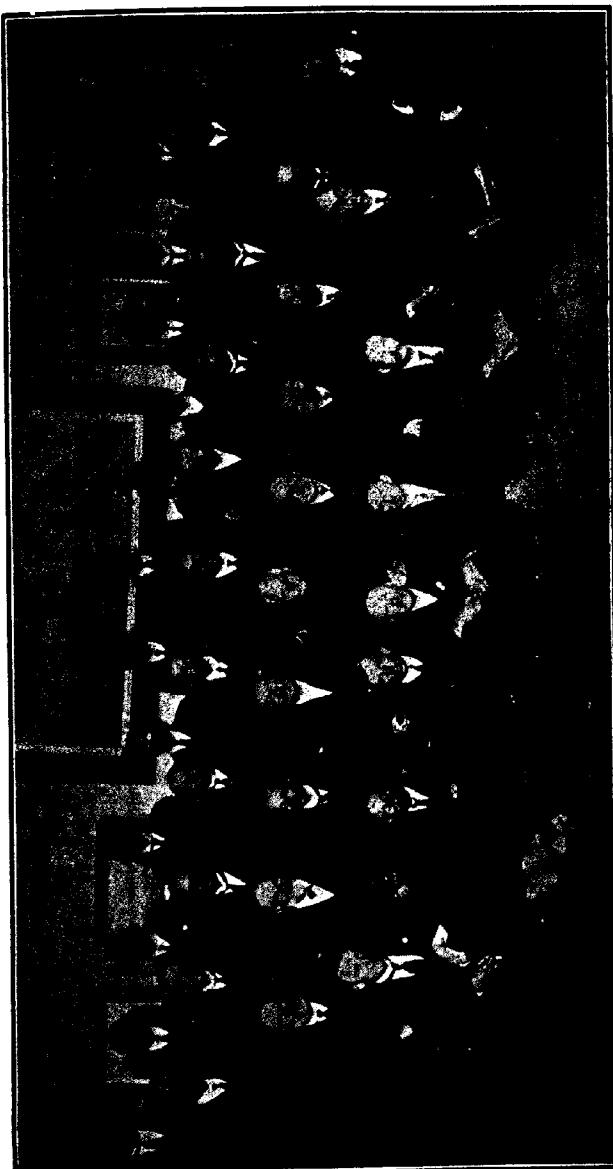
On the motion of Mr. J. Elliott, it was resolved that "this Conference approves of the policy of afforestation for the southern districts and elsewhere, and urges on the Government the necessity for carrying forward such a policy."

The greater part of the evening session was devoted to Free Parliament, during the course of which the Director of Agriculture (Professor Arthur J. Perkins) answered a number of questions which had been submitted by different Branches. The Director dealt at length with the cultivation of tobacco and flax.

### BOXTHORN.

At the instance of Mr. F. Allison (Strathalbyn), seconded by Mr. J. F. Dodd, it was resolved, "That in the opinion of this Conference, so long as the words 'hedge or breakwind' remain in the proclamation declaring boxthorn a noxious weed, it will remain inoperative."

It was decided that the gathering next year should be held at Port Elliot.



The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) and some of the Delegates who attended the Conference of Southern Branches of the Agricultural Bureau at Strathalbyn.

**CONFERENCE OF PINNAROO DISTRICT BRANCHES.**

A representative gathering of delegates from the Branches of the Agricultural Bureau situated along the Pinnaroo line of railway attended the Annual Conference, which was held at Lameroo on August 26th. Although the Conference was confined to two sessions, the business-like manner in which proceedings were conducted enabled a good programme to be dealt with thoroughly. The chair was occupied by Mr. E. F. Davidson, who was supported by Captain S. A. White, C.M.B.O.U., Professor Arthur J. Perkins (Director of Agriculture), and Mr. H. J. Finnis (Acting Secretary Advisory Board), representing the Department of Agriculture.

**SHEEP IN THE MALLEE DISTRICT.**

After the opening address had been delivered by Captain White, attention was directed to a consideration of the most suitable sheep with which to stock a mallee farm, and the benefits likely to be derived therefrom, the subject being introduced in a paper by Mr. H. C. Colwill, of the Claypan Bore Branch. The conclusion of the writer of the paper was that the most useful sheep for the mallee farmer was the comeback, especially if the crossbred was of the Lincoln or Leicester breed. If wethers and lambs were bought at the "right price" they would pay the average farmer better than ewes. The question was vigorously debated by delegates, there being considerable diversity of opinion as to the type of sheep most profitable. The Director of Agriculture (Professor Perkins) summed the matter up in his statement that after all it was mainly a question of personal likes and dislikes. The wether flock was more easily handled than the ewes, but he thought the lambing flock was really the flock for the farmer, for it eliminated much of the element of speculation, and provided a return from yearly sales.

**CROP ROTATION.**

Mr. A. J. A. Koch, of the Lameroo Branch, then read a paper, entitled "Crop Rotation: Its Relation to the Future Prosperity of the Pinnaroo District." The prevailing practice of the district he mentioned as a fallow-wheat-oats rotation. He suggested alternatives as follows:—(1) Fallow-wheat-pease-oats-oats, and (2) fallow-wheat-fallow-oats, and dealt with the possible returns from each system. In the discussion which followed interest chiefly centred on pease as a crop for the Pinnaroo district.

**FREE PARLIAMENT.**

The evening session was devoted to considering a number of subjects listed on the agenda under the heading, "Free Parliament." After having decided that the Conference should be held next year at Parilla, the gathering turned its attention to railway freights, and resolved that the Government should be asked to reduce the freight on fencing materials to the same level as that of firewood. The opinion was expressed that under the present condition of the markets of the world it was necessary that the Wheat Pool should be continued. It was also decided that the Forest Department should be asked to plant a certain area of the Parilla Forest Reserve with olives. A number of questions submitted by delegates were replied to by the Director of Agriculture.

## EGG-LAYING COMPETITION, 1920-1921.

OLD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION  
OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

WELVE MONTHS' TEST STARTED ON APRIL 1ST, 1920, AND TO TERMINATE MARCH 31ST, 1921.]

## SECTION I.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Name and Address.	Bird No.	Month ending 31/8/20.	Score to Date.	Bird No.	Month ending 31/8/20.	Score to Date.	Bird No.	Month ending 31/8/20.	Score to Date.
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## WHITE LEGHORNS.

Wetelsmeier, C. B., Kensington ..	1	7	35	2	9	18	3	13	30
Donnell, G., Auburn, Melbourne ..	4	14	32	5	9	41	6	9	49
acey, R. S., Hamley Bridge ..	7	16	16	8	5	5	9	14	34
yan, J., Silvan, Victoria ..	10	17	30	11	19	62	12	20	27
orite Bros., Kalangadoo ..	13	17	61	14	6	40	15	13	63
rown, J. P., Ballarat, Victoria ..	16	6	11	17	12	37	18	8	35
ogers, A. H., Richmond, S.A. ..	19	1	13	20	6	9	21	7	32
skermann, W. P., Eudunda ..	22	7	27	23	14	29	24	8	8
arton, C. J., Mallala ..	25	—	4	26	1	8	27	—	—
ythien, E. W., Scott's Creek ..	28	1	2	29	2	3	30	3	8
orite Bros., Kalangadoo ..	31	20	23	32	14	43	33	9	51
mea, H. B., Kew, Victoria ..	34	17	20	35	7	20	36	9	52
onkhouse, A. J., Woodside ..	37	9	20	38	17	29	39	17	45
ear, H. S., Broken Hill ..	40	—	11	41	8	44	42	11	17
antree, W., Broken Hill ..	43	—	1	44	—	1	45	2	8
ythien, E. W., Scott's Creek ..	46	6	7	47	—	8	48	—	6
ooking, E. D., Kadina South ..	49	—	6	50	6	22	51	8	17
aymoor Poultry Farm, Kilkenny ..	52	1	5	53	5	24	54	—	3
eegan, H. V., Wallaroo ..	55	—	—	56	3	3	57	—	—
mpt, Mrs. S., Piccadilly ..	58	5	38	59	6	27	60	11	30
arsons, E. H., Pinnaroo ..	61	11	21	62	3	4	63	4	12
aymoor Poultry Farm, Kilkenny ..	64	8	39	65	5	30	66	5	8
evens, H. J., Broken Hill ..	1	8	29	2	10	24	3	17	25
lenelg River Poultry Farm, Mt. Gambier ..	4	16	56	5	17	56	6	13	67
illington, Mrs. G., Milang ..	7	9	16	8	4	8	9	10	26
atledge, M., Broken Hill ..	10	17	40	11	—	6	12	6	16
roce, Wm., Sefton Park ..	13	15	25	14	18	43	15	—	3
ockman, A., Goodwood ..	16	14	20	17	18	33	18	8	8
itter, Wm., Magill ..	19	9	19	20	10	26	21	6	26
lake, Mrs. M., Berowra, N.S.W. ..	22	4	26	23	8	30	24	17	33
idston, M., Cheltenham ..	25	6	21	26	9	49	27	12	61
amford, W. H., Glenelg ..	28	14	45	29	19	67	30	8	53
Indyridge Poultry Farm, Blackwood ..	31	6	37	32	13	31	33	15	31
owie, H. H., Mount Gambier ..	34	11	47	35	6	36	36	16	39
reen, A. J., Crystal Brook ..	37	11	47	38	14	70	39	7	13
reen, F. W. H., Monteith ..	40	17	61	41	13	54	42	15	47
ivett, J., Lockleys ..	43	—	—	44	—	—	45	—	—
mall, E. W., Mount Gambier ..	46	1	12	47	6	25	48	7	8
erbert, C., Alberton ..	49	6	26	50	6	16	51	15	49
olmes, F. A., Naracoorte ..	52	9	10	53	5	7	54	9	21

EGG-LAYING COMPETITION—*continued.*

Row No.	Name and Address.	Bird No.	Month ending 31/8/20.	Score to Date.	Bird No.	Month ending 31/8/20.	Score to Date.	Bird No.	Month ending 31/8/20.
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WHITE LEGHORNS—*continued.*

B	Green, F. W. H., Monteith .....	55	8	21	56	13	58	57	17
B	Herbert, C., Alberton .....	58	7	10	59	4	7	60	5
B	Uriwin, A. P., Balaklava .....	61	8	38	62	4	13	63	5
B	Purvis, W., Glanville Blocks .....	64	6	12	65	13	46	66	4
C	Green, F. W. H., Monteith .....	1	4	23	2	9	38	3	13
C	Holmes, F. A., Naracoorte .....	4	7	12	5	2	3	6	—
C	Axtell, Mrs. J., Glen Osmond .....	7	9	21	8	10	28	9	9
C	Finn, H. J., jun., Angaston .....	10	1	6	11	3	12	12	2
C	Coleman, A. C., Grange .....	13	5	13	14	16	40	15	3
C	Green, F. W. H., Monteith .....	16	16	57	17	18	54	18	12
C	Anderson, J., Prospect .....	19	15	24	20	—	2	21	3
C	Axtell, Mrs. J., Glen Osmond .....	22	9	20	23	8	16	24	9

## TWO WHITE LEGHORNS, ONE ANCONA.

C	Tester, Geo. P., Naracoorte .....	25	8	22	26	17	64	27	8
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## SECTION 2.—HEAVY BREEDS (SINGLE TESTING). THREE PULLETS IN EACH EN

## BLACK ORPINGTONS.

C	Lawson, E. A., Camberwell, Victoria .....	28	15	17	29	3	9	30	8
C	Bertelsmeier, C. B., Kensington .....	31	15	86	32	7	35	33	16
C	Shaw, R. R., Crystal Brook .....	34	7	41	35	16	25	36	5
C	Jarman, T. E., Epping, N.S.W. ....	37	—	1	38	—	—	39	3
C	Hogg, R. J., Morphett Vale .....	40	3	3	41	9	19	42	—
C	Shaw, R. R., Crystal Brook .....	43	20	28	44	8	9	45	3
C	Holmes, F. A., Naracoorte .....	46	5	12	47	5	5	48	14
C	Butfield, C. C., Crystal Brook .....	49	19	21	50	5	6	51	21
C	Shevill, W. A., Beaumaris, Victoria .....	52	6	9	53	—	—	54	5
C	Eckermann, W. P., Eudunda .....	55	—	—	56	10	28	57	19
C	Lampert, Mrs. S., Piccadilly .....	58	11	42	59	5	12	60	—
C	Bansemmer, Mrs. B., Beaumont .....	61	13	37	62	17	43	63	20
C	Siebler, J. M., North Broken Hill .....	64	6	60	65	22	65	66	8
D	Holmes, F. A., Naracoorte .....	1	24	77	2	Dead	3	21	—
D	Purvis, W., Glanville Blocks .....	4	13	18	5	Dead	6	6	—
D	Bertelsmeier, C. B., Kensington .....	7	9	62	8	14	22	9	2
D	Tester, G. P., Naracoorte .....	10	15	19	11	12	16	12	6
D	Kalma, A. G., Neale's Flat .....	13	—	4	14	11	19	15	3

## RHODE ISLAND REDS.

D	Stacey, R. S., Hamley Bridge ..	16	6	6	17	4	4	18	8
D	Stockman, A., Goodwood .....	19	18	43	20	18	39	21	17

## RHODE ISLAND WHITES.

D	Bansemmer, Mrs. B., Beaumont ..	22	3	3	23	—	—	24	9
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## SECTION 3.—LIGHT BREEDS (PEN TEST). SIX PULLETS IN EACH PEN.

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending '20.	Total Eggs Laid from 1/4/20 to 31/8/20.
1	Hodges, F., Ballarat North, Victoria	White Leghorns .....	94	374
2	Bertelsmeier, C. B., Kensington .....	" .....	95	291
3	Beythien, E. W., Scott's Creek .....	" .....	80	140
4	McDonnell, G., Auburn, Victoria .....	" .....	77	274
5	Bertelsmeier, C. B., Kensington .....	" .....	97	258
6	Thompson, E. F., Franklin .....	" .....	72	265
7	Purvis, W., Glanville Blocks .....	" .....	114	290
8	Smith & Gwynne, Gawler South .....	" .....	94	188
9	Anderson, S., Gawler Railway .....	" .....	92	356
10	Eckermann, W. P., Eudunda .....	" .....	71	234
11	Beythien, E. W., Scott's Creek .....	" .....	102	183
12	George, R., New Queenstown .....	" .....	92	346
13	Deacon, J. R., Solomontown .....	" .....	80	299
14	Alford, Thos., Broken Hill .....	" .....	109	309
15	Evans, H. A., Richmond .....	" .....	112	461
16	Connor, D. C., Gawler .....	" .....	89	223
17	Raymoor Poultry Farm, Kilkenny Blocks	" .....	102	307
18	Lampert, Mrs. S., Piccadilly .....	" .....	77	180
19	Pool, F. J., North Norwood .....	" .....	83	137
20	Woodhead, N., Torrensville .....	" .....	107	194
21	Thompson, E. F., Franklin .....	" .....	59	156
22	Randall, J., Bowden .....	" .....	55	97
23	Earle, E., Solomontown .....	" .....	110	200
24	Willington, Mrs. G., Milang .....	" .....	102	219
25	Vetoe, Wm., Sefton Park .....	" .....	106	367
26	Pugsley, A., Hindmarsh .....	" .....	70	188
27	Howie, H. H., Mount Gambier .....	" .....	111	264
28	Purvis, W., Glanville Blocks .....	" .....	66	219
29	Anderson, W., Kapunda .....	" .....	59	171
30	Eldridge, J. H., Norwood .....	" .....	—	—
31	Pope Bros. & Co., Hectorville .....	" .....	69	276
32	Oakey, E., Mannahill .....	Brown Leghorns .....	51	172
33			71	156

## SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.

34	Hogg, R. J., Morphett Vale .....	Black Orpingtons .....	83	197
35	Bertelsmeier, C. B., Kensington .....	" .....	116	349
36	Eckermann, W. P., Eudunda .....	" .....	88	289
37	Lampert, Mrs. S., Piccadilly .....	" .....	69	273
38	Bertelsmeier, C. B., Kensington .....	" .....	77	300
39	Bansemier, Mrs. B., Beaumont .....	" .....	74	164
40	Purvis, W., Glanville Blocks .....	" .....	95	265
41	Siebler, J. M., North Broken Hill .....	" .....	83	338
42	Bertelsmeier, C. J., Kensington .....	" .....	120	427
43	Purvis, W., Glanville Blocks .....	" .....	88	316
44	Frost, F. W., Wallaroo .....	Barred Rocks .....	73	94
45	Lampert, Mrs. S., Piccadilly .....	Black Orpingtons .....	107	435

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of August, 1920, also the average precipitation to end of August, and the average annual rainfall.

Station.	For Aug., 1920.	To end Aug., 1920.	Avg. to end Aug.	Avg. Annual Rainfall	Station.	For Aug., 1920.	To end Aug., 1920.	Avg. to end Aug.	Avg. Annual Rainfall					
FAR NORTH AND UPPER NORTH.														
Oodnadatta .....	1.55	5.51	3.42	4.73	Spalding .....	4.13	14.69	13.20	20.12					
Marree .....	1.42	8.13	4.07	6.02	Gulgarn .....	3.54	14.19	12.60	18.97					
Farina .....	1.26	6.81	4.59	6.57	Yacka .....	2.95	10.92	10.55	15.27					
Copley .....	1.98	7.40	5.82	8.30	Koolunga .....	2.31	10.78	10.96	15.73					
Beltana .....	1.90	6.73	6.13	8.93	Snowtown .....	2.22	12.60	11.26	15.87					
Blinman .....	2.63	9.91	8.83	12.52	Brinkworth .....	2.83	12.42	10.84	15.91					
Tarcoola .....	1.02	8.02	4.84	7.33	Blyth .....	2.64	13.06	11.51	16.55					
Hookina .....	2.54	12.83	8.70	12.65	Clare .....	4.37	19.28	16.91	24.47					
Hawker .....	2.69	12.99	8.62	12.37	Mintaro .....	4.48	20.00	15.92	23.07					
Wilson .....	2.61	14.35	8.25	11.86	Watervale .....	4.64	19.87	19.22	27.44					
Gordon .....	2.56	9.67	7.19	10.43	Auburn .....	4.72	17.12	16.94	24.32					
Quorn .....	2.55	11.05	9.69	13.79	Hoyleton .....	2.89	11.49	12.31	17.82					
Port Augusta .....	1.76	7.76	6.36	9.42	Balaklava .....	2.62	10.92	10.93	15.82					
Port Augusta West .....	1.95	7.77	6.22	9.36	Port Wakefield .....	2.25	10.20	9.47	13.14					
Bruce .....	1.81	8.22	7.78	9.99	Terowie .....	2.20	7.05	8.97	13.54					
Hammond .....	2.33	9.39	7.68	11.36	Yarowie .....	2.76	7.83	9.44	13.97					
Wilmington .....	3.36	12.77	11.55	18.06	Hallett .....	3.30	11.15	10.93	16.28					
Willowie .....	1.78	8.60	7.52	11.82	Mount Bryan .....	3.07	11.26	10.97	16.38					
Melrose .....	4.46	16.66	16.21	23.11	Burns .....	3.42	12.72	12.21	17.91					
Booleroo Centre .....	2.60	9.73	10.55	15.51	Farrell's Flat .....	3.55	13.46	13.11	18.87					
Port Germen .....	2.29	8.85	8.64	12.65	WEST OF MURRAY RANGE.									
Wirnabara .....	3.90	16.25	13.54	19.44	Manoora .....	4.04	14.31	12.62	18.54					
Appila .....	2.24	9.65	8.93	14.90	Saddleworth .....	4.46	12.96	12.68	19.75					
Craddock .....	2.60	11.40	7.75	10.82	Marrabel .....	4.17	15.00	12.47	19.44					
Carrieton .....	2.70	10.51	8.50	12.34	Riverton .....	3.84	13.17	14.39	20.74					
Johnburg .....	2.10	8.43	6.89	10.22	Tarlee .....	2.87	10.21	12.17	17.86					
Eurelia .....	2.54	9.87	9.04	13.11	Stockport .....	2.81	10.89	11.02	16.36					
Orroroo .....	2.41	9.84	9.29	13.42	Hamley Bridge .....	2.50	10.27	11.26	16.52					
Nackara .....	2.44	8.27	7.58	10.63	Kapunda .....	3.16	9.79	12.76	19.85					
Black Rock .....	2.71	10.34	8.41	12.29	Freeling .....	2.57	10.45	12.35	17.95					
Ucolta .....	1.81	7.50	8.05	11.65	Greenock .....	3.81	13.19	14.86	21.73					
Peterborough .....	2.08	8.60	8.90	13.28	Truro .....	3.60	12.03	13.96	20.18					
Yongala .....	2.59	10.75	9.50	14.13	Stockwell .....	3.58	11.90	14.01	20.49					
LOWER NORTH-EAST.														
Yunta .....	2.16	7.18	5.71	8.40	Nuriootpa .....	3.47	12.90	14.58	21.09					
Waukaringa .....	1.95	7.44	5.40	8.15	Angaston .....	3.65	14.98	15.64	22.54					
Mannahill .....	1.65	4.99	5.64	8.51	Tanunda .....	4.10	14.33	15.60	22.33					
Cookburn .....	2.58	5.59	5.55	8.03	Lyndoch .....	4.79	18.48	15.95	22.81					
Broken Hill, NSW .....	2.33	4.99	6.73	9.89	Williamstown .....	4.72	18.81	20.07	27.74					
LOWER NORTH.														
Port Pirie .....	1.80	9.19	9.08	13.26	ADELAIDE PLAINS.									
Port Broughton .....	1.82	10.93	9.90	14.13	Mallala .....	2.32	11.25	11.52	16.61					
Bute .....	2.50	12.67	11.09	15.55	Roseworthy .....	3.08	12.28	11.98	17.37					
Laura .....	3.15	13.91	12.58	18.12	Gawler .....	2.92	13.94	13.49	19.14					
Caltowie .....	3.04	10.69	11.32	17.02	Two Wells .....	2.01	10.58	11.37	15.91					
Jamestown .....	3.85	13.98	10.84	17.56	Virginia .....	2.24	12.69	12.30	17.31					
Bundaleer W.Wks .....	3.83	14.43	11.49	17.56	Smithfield .....	2.34	12.23	11.81	17.13					
Gladstone .....	3.61	12.16	10.67	16.05	Salisbury .....	2.40	12.24	13.31	18.52					
Crystal Brook .....	2.92	12.51	10.65	15.62	North Adelaide .....	4.01	19.89	15.70	21.87					
Georgetown .....	3.98	14.57	12.49	18.30	Adelaide .....	3.38	17.90	15.15	21.01					
Narridy .....	2.54	10.57	11.31	16.43	Glenelg .....	2.17	13.99	13.27	18.42					
Redhill .....	2.41	12.51	11.75	16.66	Brighton .....	3.40	17.91	15.03	21.03					
					Mitcham .....	4.73	23.11	17.21	23.68					
					Glen Osmond .....	4.68	21.05	18.67	25.73					
					Magill .....	4.32	19.36	18.33	25.38					

RAINFALL—*continued.*

Station.	For Aug., 1920.	To end Aug., 1920.	Av'ge. to end Aug.	Av'ge. Annual Rainfall	Station.	For Aug., 1920.	To end Aug., 1920.	Av'ge. to end Aug.	Av'ge. Annual Rainfall					
<b>MOUNT LOFTY RANGES.</b>														
tree Gully.....	4.50	20.97	19.83	27.73	Cummins .....	2.91	15.16	—	—					
ing West .....	7.74	35.41	34.20	46.82	Port Lincoln .....	3.34	16.08	14.86	19.83					
da .....	5.80	29.60	32.62	44.49	Tumby .....	1.85	10.65	10.13	14.76					
ndon .....	4.02	23.74	24.08	33.18	Carrow .....	1.36	7.35	9.49	15.14					
phett Vale .....	2.99	16.51	16.11	22.90	Arno Bay .....	1.14	6.74	8.88	13.10					
Hunga .....	3.10	16.69	14.60	20.21	Cleve .....	2.37	—	—	—					
unga .....	3.82	22.71	18.86	25.82	Cowell .....	1.56	5.57	7.96	11.56					
nga .....	2.92	16.69	14.67	20.22	Point Lowly .....	1.20	6.01	7.66	11.84					
onga.....	3.72	23.55	—	—	<b>WEST OF SPENCER'S GULF—<i>continued.</i></b>									
manville .....	3.42	17.34	15.09	20.53	Wallerac .....	2.20	10.76	10.29	14.11					
kalilla .....	3.90	20.23	17.54	22.93	Kadina .....	2.83	13.87	11.70	15.93					
nt Pleasant .....	6.25	21.57	19.23	27.01	Moonta .....	2.09	11.08	11.24	15.31					
wood .....	5.73	20.23	21.10	29.43	Green's Plains .....	2.71	11.95	11.43	15.75					
eracha .....	6.32	24.94	23.62	33.33	Maitland .....	2.58	13.96	14.76	20.20					
brook Rsvr. ....	6.26	—	—	Ardrossan .....	2.04	9.89	10.04	13.96						
edvale .....	6.80	26.58	25.81	35.60	Port Victoria .....	2.60	11.03	11.24	15.34					
dsdie .....	6.63	25.85	22.89	32.05	Curramulka .....	2.19	12.02	13.35	18.31					
leside.....	6.29	25.11	24.78	34.81	Minlaton .....	2.48	14.99	13.08	17.70					
ne .....	4.97	18.51	19.87	28.58	Brentwood .....	2.24	12.73	11.07	15.44					
nt Barker .....	5.75	23.89	22.16	31.10	Stansbury .....	2.62	11.48	12.31	17.08					
unga .....	6.76	26.69	—	32.94	Warooka .....	2.23	12.11	13.23	17.74					
lessfield .....	5.56	21.76	20.77	30.60	Yorketown .....	2.75	13.43	12.57	17.29					
dows .....	6.34	25.20	24.51	36.26	Edithburgh .....	2.50	11.59	12.08	16.58					
thalbyn .....	3.59	13.29	13.59	19.28	<b>SOUTH AND SOUTH.EAST.</b>									
<b>MURRAY FLATS AND VALLEY.</b>										Cape Borda .....	4.70	26.17	19.50	24.96
ingie .....	3.17	10.96	13.31	18.77	3.54	20.34	14.19	18.92						
ng .....	2.64	9.16	11.01	15.56	Kingscote .....	3.31	15.58	15.96	21.39					
ghorne's Bdgr. ....	2.29	8.88	9.90	14.59	Peneshaw .....	3.40	15.80	15.40	21.56					
lington .....	2.36	7.69	9.20	14.82	Victor Harbor .....	3.32	15.66	14.29	20.00					
en Bend .....	2.49	8.59	9.25	14.55	Port Elliot .....	2.22	10.97	12.70	17.87					
ray Bridge .....	2.37	6.96	9.42	13.98	Mindarie .....	2.00	—	—	—					
ington .....	2.65	8.41	10.67	15.45	Karoonda .....	3.00	—	—	—					
num .....	2.09	6.36	8.00	11.51	Pinnaroo .....	3.31	8.54	10.09	15.57					
ner .....	3.50	10.16	10.15	15.23	Parilla .....	3.33	10.11	8.91	14.02					
n .....	2.88	8.07	8.30	12.07	Lameroo .....	3.49	9.41	10.56	16.45					
n Reach .....	1.78	5.85	6.94	10.80	Parrakie .....	3.76	10.37	9.13	14.42					
chetown .....	1.44	4.26	6.83	10.26	Geranium .....	3.69	11.22	10.33	16.24					
unda .....	2.78	9.95	11.91	17.51	Peake .....	3.40	10.64	10.54	16.25					
herlands .....	2.12	5.86	7.15	10.90	Cooke's Plains .....	2.99	8.66	10.12	15.00					
gan .....	1.91	5.16	5.79	9.13	Coomandook .....	3.24	9.91	11.89	17.75					
kerie .....	3.14	6.56	5.79	9.41	Coonalpyn .....	3.04	9.64	12.07	17.64					
rland Corner .....	2.20	5.00	7.12	11.11	Tintinara .....	4.08	12.00	12.55	18.83					
ton .....	3.27	8.75	8.04	12.27	Keith .....	2.96	12.36	12.08	18.54					
mark .....	2.89	6.97	7.70	10.92	Bordertown .....	4.80	13.51	13.09	19.52					
<b>WEST OF SPENCER'S GULF.</b>										Wolseley .....	5.04	13.88	12.03	18.07
la .....	0.90	5.17	8.07	10.03	Frances .....	3.08	11.57	13.24	20.10					
ite Well .....	0.84	4.62	6.58	9.24	Naracoorte .....	4.62	16.59	17.65	22.53					
ler's Bay .....	2.24	11.87	9.43	12.11	Penola .....	4.61	19.55	18.36	26.48					
ong .....	2.29	8.95	9.35	12.26	Lucindale .....	4.86	19.18	16.26	22.93					
at Bay .....	1.91	6.75	7.32	10.47	Kingston .....	4.12	19.38	18.02	24.51					
ky Bay .....	2.29	9.83	7.24	10.37	Robe .....	5.32	23.88	18.59	24.60					
ina .....	2.68	11.66	9.31	12.97	Beachport .....	5.00	26.39	20.83	27.29					
aky Bay .....	2.86	16.69	11.57	15.09	Millicent .....	5.22	28.76	21.64	29.29					
ia .....	3.05	13.93	10.87	15.35	Kalangadoo .....	5.23	26.10	—	—					
t Elliston .....	3.45	20.49	11.55	16.37	Mount Gambier .....	4.41	21.87	21.26	31.65					

## AGRICULTURAL BUREAU REPORTS.

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Borrika .....	*	25	23	Julia .....	*	—	—
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Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	21	26	Kilkerran .....	167	23	21
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Moorook .....	180	—		Salt Creek .....	5	25	23
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Mount Remarkable .....	*	—		Tarcowie .....	160	28	26
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Narryd .....	5	11	9	Warcowie .....	*	22	27
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\* No report received during the month of August.      + Formal report only received.

† Held over until next month.

‡ Report of annual meeting received.

## THE AGRICULTURAL BUREAU.

**Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.**

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### HOMESTEAD MEETING AT HARTLEY.

For some time it has been the practice of the Hartley Branch of the Agricultural Bureau to hold its annual meeting at the homestead of one of the members. On a number of occasions the place of meeting has been "Burnlee," the holding of Mr. J. M. Hudd, at which place the gathering was held again this year. A profitable and pleasurable outing was the result. The afternoon was spent in inspecting the dairy herd and the farm appointments, with field sports to provide a leaven of pleasure. In the evening members and visitors, including the Commissioner of Crown Lands (Hon. G. R. Laffer, M.P.); Captain H. Hudd, M.C., M.P.; the Director of Agriculture (Professor Arthur J. Perkins); Acting Secretary, Advisory Board of Agriculture (Mr. H. J. Finnis); and representatives of the Mount Barker, Strathalbyn, Brinkley, Ashbourne, and Milang Branches of the Bureau, sat down to dinner as the guests of Mr. and Mrs. Hudd. At the instance of the Chairman (Mr. J. Stanton) the loyal toast was honored. A lengthy toast list followed. The retiring Hon. Secretary (Mr. C. M. Hudd) read the annual report of the work of the Branch, and the Hon. G. R. Laffer presented a number of certificates to workers in the interests of the Red Cross.

## REPORTS OF BUREAU MEETINGS.

### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

AMYTON (Average annual rainfall, 31.82in.).

June 29th.—Present: six members and visitors.

**THE AGRICULTURAL OUTLOOK.**—Mr. S. Thomas, who read a short paper dealing with this question, said many persons appeared to lament the persistent drift of the rural population to the city, yet it was very seldom one heard of any steps being taken to mitigate that evil. The farmers, by working long hours and denying themselves ordinary recreation and amusement made their holdings a successful undertaking, but that tended to make farm life a very dull existence, with the inevitable result that the young people turned to the cities and larger country centres, where they could obtain amusement and recreation. The speaker referred to co-operation, and believed that it could, with advantage, be extended to cover all the farmers' products and most of his requirements.

APPILA YARROWIE (Average annual rainfall, 15.08in.).

Present: 17 members.

**COLT BREAKING.**—Mr. J. R. Harvie, in a paper dealing with this subject, expressed the opinion that the easiest colt to handle was one that had been petted when it was a foal. There were many different opinions expressed as to what was the correct age at which to break in the colt, but he thought if the animal was worked before it was three years old it would not have a fair chance to grow into a fully developed horse. His method of breaking in the colt was to run the animal into a small yard with an older horse, and then approach it gently until a rope could be placed around its neck. The rope should then be fastened to a post, and if a little patience were exercised it would not be difficult to put the headstall on. The next procedure was to rub the colts

With the object of facilitating the

## **Training of Returned Soldiers**

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Who intend taking up agricultural pursuits,  
the Government has made provision whereby  
trainees may be employed

### **BY INDIVIDUAL FARMERS.**

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Farmers may contract to employ one or  
more trainees for a period of 12 months.

---

#### **CONDITIONS:**

Employer finds board and lodging in his home, or boards  
trainee out when not possible to take him into the home, or  
he may pay trainee 25s. per week and find quarters—trainee  
then provides for himself.

Employer pays 12s. 6d. per week, monthly, to the Minister,  
through this office. The Minister pays trainee 30s. per week,  
monthly.

Contract is made for 12 months between employer and  
Minister, terminable at any time by the employer should the  
trainee misconduct himself, or should the employer have any  
good reason for dismissal which could be indorsed by the  
Minister; failure of employer to keep his contract (incom-  
petency or misconduct) enables trainee to terminate contract.

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For detailed particulars apply—

Superintendent of Soldier Settlements,

Victoria Square,

Adelaide.

back, neck, and legs with a stick. A pair of reins about 25ft. in length should then be attached to the headstall and the animal driven out into a larger paddock. After the colt had been driven around for about an hour he could be hitched to a medium-sized log and taught to start and stop at the word of command. A half a day's work in the body of the wagon should be his first actual part in the work of the farm. When the harness was removed the shoulders should be washed with cold water, to which had been added a few grains of condy's crystals. The Hon. Secretary (Mr. F. A. George) presented the annual report, and the officers were elected for the ensuing term.

**HOOKINA** (Average annual rainfall, 12in.).

July 29th.—Present: 10 members.

**HORSE SHOEING.**—In a short paper on this subject Mr. J. Murphy said any horse that had to work on metal roads should be kept properly shod. If shoeing was neglected the animal became tenderfooted, which made the hoof soft and brittle. After the shoes had been on for about six weeks he thought it was advisable to remove them. An interesting discussion followed in which Messrs. P. Heneschke, J. O'Connor, and S. Stone took part. The Hon. Secretary (Mr. B. Murphy) presented the annual report, and the officers were elected for the coming year

**MORCHARD.**

July 24th.—Present: 11 members and one visitor.

**PRUNING FRUIT TREES.**—The Secretary (Mr. F. J. B. Scriven) contributed a paper on this subject. The object of pruning, he said, was to lengthen the life of the tree and improve the quality of the fruit and the shape of the tree. All trees should be pruned before the sap rose, which was generally at the end of the autumn. The usual practice with young trees was to train them to the shape required by cutting back the new wood growth and leaving two or three branches that had an outward tendency. As the trees grew the same plan was followed and the centre kept fairly clear of branches. If the growth was good they should cut back last year's wood to about 8in. or 10in. long, and if growth was poor, cut shorter. With grape vines about two buds were usually enough to leave, and the spurs should not be too close together. When a vine was doing well it would throw out several branches close together; in such cases, all with the exception of the one that was strongest and in the most suitable position, should be cut. Good work could be done by summer pruning fruit trees, surplus shoots could be broken off, and also those that were too low down and in the centre of the tree, the young shoots, excepting the main one, could also be cut back. If that course was followed the fruit buds for the next year would be formed nearer the stem, and consequently the fruit would not be destroyed by wind, because it would grow closer to the main stem instead of being on the top or at the end of the branches.

**ORROROO** (Average annual rainfall, 13.42in.).

July 31st.—Present: nine members.

**HOMESTEAD MEETING.**—The monthly meeting of the Branch was held at the residence of Mr. J. Dennis. An instructive afternoon was spent in the orchard, when Mr. Tapscott gave a short address on "Pruning and Planting Trees." The meeting was continued in the evening, when a discussion on the work done during the afternoon took place. The Hon. Secretary (Mr. J. J. Dennis) read the annual report, and the officers were elected for the ensuing 12 months.

**TARCOWIE** (Average annual rainfall, about 15 $\frac{1}{2}$ in.).

July 27th.—Present: six members and two visitors.

**MIXED FARMING.**—Mr. W. S. Ninnis contributed a short paper on this subject. He was of the opinion that mixed farming was the most suitable system for that district, because if the price of wheat was low or the wheat crop was a failure, there would be other sources to depend on. Whilst wheat was the main item from which income was derived, the farmer should endeavor to raise as much as possible in other ways. One-third of the farm should be under crop each year, with wheat principally,

while a few acres should be sown with oats and a few with barley to provide corn for the horses. Sufficient hay should be cut from the crop to feed the horses required to do the work on the farm. One-third of the land should be fallowed for the next crop; the remaining third could then be kept for grazing purposes. Sheep could be kept on a portion of the land that was not required for horses or cows. They would provide the household with meat, and the surplus sheep, together with the wool, could be sold. Except for the sheep required for rations, a majority of ewes of good class should be kept, and of that number 25 per cent. should be ewe lambs. The sheep for sale would consist mostly of lambs. Cows also should be kept. For each pair of hands available to do the milking he would keep three cows. They should be milked for about nine months of the year, care being taken not to have all the cows dry at the same time. The calves should be sold when about 12 months old, because if they were kept longer less sheep could be kept. Two or three sows also could profitably be kept. Two litters each could be reared each year, and the young pigs sold when old enough to wean, or kept until fattened and sold at about six months. Milk from the dairy that was not required for feeding the calves could be used for fattening pigs. Fowls also were an asset on the farm. From 100 to 200 of a good laying strain should be kept, including also some good table birds for household use. Ducks, geese, and turkeys would also be profitable. All the food consumed by the pigs and poultry could be grown on the farm. Either wheat, oats, or barley used for that purpose would pay better, generally, than by selling it at market price. If proper attention was given to mixed farming it was surprising what amount of income could be raised other than by wheat-growing. A good discussion followed the reading of the paper.

#### WILMINGTON (Average annual rainfall, 18.26in.).

August 4th.—Present: 12 members and visitors.

**ROLLING WHEAT CROPS.**—In the course of a short paper on this subject, Mr. D. S. George said all crops in that district that were intended for hay should be rolled, because the crop could be cut at least 2in. closer to the ground. In addition to that, a heavier cut of hay would be secured, and the binder would not receive such rough usage. The crops should be rolled when about 3in. high, and preferably after a light shower, so that the stones would be pushed below the surface of the soil. During dry seasons he was in favor of rolling the whole of the wheat crop because it made the soil firm around the roots of the plants, and that tended to make the crop yield a heavier return. Messrs. Stephens and Modystach, in discussing the paper, agreed that all wheat crops should be rolled, particularly those sown on stony land, because it encouraged a better stooling for the plants. Mr. Zimmermann said there was no doubt that rolling was very beneficial to the wheat crops, providing it was carried out when the land was fairly soft. The plants should, however, be allowed to come through the surface properly before the roller was used.

**AMYTON**, August 3rd.—The Hon. Secretary (Mr. T. Ward) read the annual report, and the officers were elected for the ensuing 12 months. Mr. L. N. Mills read a paper, "The Agricultural Outlook," and a good discussion followed.

#### MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

**BEETALOO VALLEY** (Average annual rainfall, 18in. to 19in.).

July 28th.—Present: 12 members.

**DAIRYING.**—Mr. E. L. Billinghurst, who contributed a paper on this subject, said if one wished to make a proper success of dairying it was essential to establish permanent pasture paddocks and an unlimited supply of clean, fresh water. The speaker expressed a preference for the Milking Shorthorn, and laid particular emphasis on the need for the provision of shelter for the cows during the hot and

cold seasons of the year. The first building to be erected from the dairyman's point of view should be a silo. Next in importance came the milking shed. That should be built on a sloping piece of ground, thereby securing good natural drainage. The work of attending the cows could be done under more comfortable and healthy conditions if a cement floor was laid down. The milking of the animals was one of the most important factors in the success or otherwise of the dairy. If careless and dirty methods were adopted, it naturally followed that inferior produce would be placed on the market, and the best prices would not be realised. In the construction of the milking shed provision should be made for ventilation and access of sunlight. Before milking, the udder of each cow should be thoroughly wiped with a damp cloth to remove all dust and dirt, and the same should also apply to the hands of the person milking the cows. Regular feeding and milking hours should be set down, and the milking performed as quickly as possible. The writer believed that slow milking was responsible for many of the so-called "tough" cows. The success of the dairy depended to a large extent on the rearing of the heifer calves. The cow should be dried off about six weeks before calving, and pastured in good paddocks in which shelter had been provided. If the calves were to develop into profitable animals it was necessary to give them proper care and attention during the first six months of their lives. Concentrated foods should not be fed until the animals were at least three weeks old. In speaking of the treatment of the milk, the speaker said it should be taken from the shed as soon as possible. The separator should be kept thoroughly cleaned and well oiled, and if the milk was fed at the correct temperature, viz., from 86deg. to 98deg., and the machine worked at an even speed, one should be able to turn out high-class produce.

**POTATO AND ONION GROWING.**—In a paper dealing with this subject, Mr. J. B. Giddings said potatoes and onions should be planted in well-worked, rich, deep soil. If the plot of land available for the purpose was not particularly good, a dressing of stable manure should be applied and worked into the soil about three weeks before planting took place. If the potatoes were to be ploughed in, he would set the plough to take a 7in. furrow, and plant the seed about 15in. apart in the rows. When the plants were showing well above the ground the land should be thoroughly cultivated and the weeds kept in check. He preferred large cut potatoes for seed, and would leave two or three eyes on each set. For spring planting he favored the Pink Eye, as they usually gave good returns. Onion seed should be sown in that district in March, in a well-prepared seed bed, free from weeds. If possible, a cool or cloudy day should be selected for the planting out, and when the plants became established the plot should be kept in a nice clean condition. Harvesting should be commenced when the tops changed color, and the bulbs laid out in rows, but care should be taken not to leave them too long on the land after they were ready for stripping, because there was a danger of sunburn if the heat was at all excessive.

#### RED HILL (Average annual rainfall, 16.79in.).

August 3rd.—Present: nine members and three visitors.

**WOOL CLASSING.**—Mr. P. R. Brown contributed a paper on this subject. He said before any hard and fast rule could be laid down as to the way in which the clip should be classed, one had to take into consideration the condition of the wool. By that he meant the lack or presence of sand, burr, yolk, etc. Providing the farmer's wool was clean, he was of the opinion that two classes should be made. No. 1 containing all the brightest wool of an even length, and No. 2 all heavy, discolored, and fatty fleeces. All fleeces with wool of a tender texture should be kept separate. The pieces should also be sorted into two classes, No. 1. containing the longest, lightest, and brightest pieces, and No. 2 all discolored and matty wool. For the average farmer's flock, he thought, it was advisable to class the bellies in with the pieces after they had been properly skirted. Table locks should always be kept entirely separate from all other classes of wool. The same should also apply to stained and daggy pieces. If the fleece were skirted properly and rolled in the correct manner it would give the wool an attractive appearance when the clip was being appraised. An interesting discussion followed.

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## WHYTE YARCOWIE (Average annual rainfall, 13.91in.).

July 25th.—Present: 11 members.

**COMMUNITY OF INTEREST.**—Mr. E. J. Pearce read an article on this subject. The paper dealt chiefly with the co-operative system as applied to the breeding of sheep. In opening the discussion Mr. Lock said that such a step would be a forward movement towards the improvement of the local flocks. Mr. Hunt favored the establishment of a permanent flock for the use of local farmers. Mr. McGregor said if several farmers decided to adopt breeding there might be considerable difficulty in the interchanging of the rams.

## WIRRABARA (Average annual rainfall, 18.91in.).

July 31st.—Present: 11 members.

**DAM SINKING.**—Mr. T. A. Stead, who read a paper on this subject, said after the site of the dam had been selected a number of trial holes should be put down to test the holding quality of the subsoil. When the excavating was being done the sides and ends of the dam should not be made too steep, in order to make the work as light as possible for the horses. By making the dam a good depth the evaporation would be reduced to a minimum. To be worked to the best advantage the dam should be three times longer one way than the other, for it could then be ploughed lengthways and scooped across. To prevent the water from overflowing he recommended making the banks somewhat higher than the actual water level. The outlet should be in such a position that it would take the surplus water away as fast as it flowed into the dam. A good plan was to sink a catch hole about a chain away from the mouth and place a few loads of large stones between it and the dam. That would prevent the silt from washing into the dam. The speaker thought it was better to erect a windmill than let the stock go down to the dam to water. There was no doubt that bullocks were the best team for dam sinking, but failing those he suggested using horses in teams of four abreast. A single furrow plough was the best implement, but it should be very strongly constructed to stand the strain of being sunk a good depth into the ground. An interesting discussion followed in which Messrs. Barclay, Bowman, Borgas, Jericho, and Pitman took part.

## YACKA.

June 29th.—Present: eight members.

**WHEAT IMPROVEMENT AND CROSS FERTILISATION.**—The Hon. Secretary (Mr. A. O. Badman) gave an address on this subject. In the course of his remarks, the speaker stated that the majority of farmers in Australia did not pay sufficient attention to the milling qualities of wheats. He was quite aware that varieties of wheat that would give increased yield should not be overlooked; but the question of milling qualities should also be borne in mind. A change of seed was not always desirable, and he believed it was a good plan to make a careful selection of the best plants and heads of the best yielding variety grown on the farm. The aim of cross-fertilisation was to improve certain characteristics of the wheat plant, such as rust, drought, and bunt resistance, retention of grain and strength of straw, increased yields and better milling qualities. The speaker then described the various points of cross-fertilisation, and gave a lucid account of the work with the aid of specimens and blackboard drawings.

**BOOLEROO CENTRE,** July 30th.—Mr. J. M. Carey read a paper, "Agriculture as a Profession." The Hon. Secretary (Mr. G. Ashby) read the annual report, and the officers were elected for the coming session.

**BUNDALER SPRINGS,** July 26th.—Mr. J. Travers gave an interesting address, "Early Settlement of the Middle Areas," in which he told of some of the difficulties that had confronted the pioneers in the early agricultural history of the State.

**LOWER-NORTH DISTRICT.**

(ADELAIDE TO FARRELL'S FLAT)

MALLALA (Average annual rainfall, 16.88in.).

August 9th.—Present: 13 members and four visitors.

DAIRYING.—Mr. W. Jarmyn contributed a paper on this subject. Three conditions, he said, were necessary for the successful practice of dairying. They were—abundance of pure water, plenty of grass and green hay chaff and bran. There were also three essentials in the manufacture of the produce, namely, proper buildings and fixtures, good cows, and absolute cleanliness. No dairy was complete without a cool room to afford cold storage for the butter. Sub-earth ventilation was best made by 6in. tiles laid 6ft. deep and 300ft. or more from the building, two of that length would be required, or, better still, one of twice the length, fitted with a wing and vane connected with the out door end to catch the air and convey it to the tile, would keep the basement well ventilated and the temperature would be the same as that of the earth in which the tiles were laid. The temperature of the dairy room should not be above 60deg., which, he thought, was the correct temperature for churning and working the butter. In so far as the storing of butter was concerned, if the temperature could be kept at about 40deg. so much the better, but that, however, could not be done without ice. If the cows were fed with plenty of grass and green hay chaff there would be no need to add coloring to the butter for home consumption. The butter should be taken from the churn and salted at the rate of two-thirds of an ounce to the pound, it should not be worked more than was absolutely necessary to distribute the salt evenly. It could then stand for six or 12 hours before being worked the last time; that would enable the salt to dissolve. From the time the butter was churned until it was packed it should be kept in a pliable and waxy condition, that could not be done unless the temperature was about 60deg. A storehouse for the cream could be constructed from an old lean to, provided the sun did not strike directly on the roof. Fine mesh wire windows and doors would be required to keep out the mosquitoes and mice when the room was opened in the evenings to allow the cool air to enter. The window should be fitted with shutters that opened from the top inside, to throw the air downward. It was a mistake to have the shutters on the outside because they helped to keep the air out. On no account should the cream be kept in a cellar unless it was freely ventilated at all times. He would have a chimney cowl with a tail affixed to catch the wind and convey it down a 4in. pipe to the bottom of the cellar or dairy. Jarrah supports covered with ruberoid roofing, and a ceiling of matchboard, he thought, would be the best. If another roof were constructed over that, with a clear air space of 18in. between, the room would be much cooler. A good discussion followed the reading of the paper.

NANTAWARRA (Average annual rainfall, 15.90in.).

July 29th.—Present: 11 members.

FALLOWING AND ROTATION OF CROPS.—Mr. R. F. Nicholls, who read a paper on this subject, said many farmers worked their land under the fallowing system of rotation, fallow, wheat, grazing, thereby obtaining one crop in three years. He believed a rotation of fallow, wheat, barley, oats, and grazing, or two crops in four years was well worth consideration. Fallowing was an expensive operation, yet one should not overlook its good points. For instance, it was one of the best methods of destroying weeds and it helped to conserve some of the spring and summer rains for the benefit of the ensuing cereal crops. In such districts as theirs, where they usually had to wait for rain before seeding could be commenced, fallowed land was a great advantage, because seeding could be pushed on with all possible dispatch as soon as rain had fallen. By dividing the farm into four divisions one could work the land in the following rotation:—Fallow, wheat, barley and oats, grazing. That system enabled one to have half the area of the farm under crop each year, as against one-third of the farm by the other method or rotation. A few years ago it did not pay to grow too much oats and barley, because the farmer had to accept low prices, but to-day

he believed the barley could be fed to pigs, and thus disposed of at a very fair profit. If that system was adopted they would be able to do less fallowing and increase the area under crop. Before the stubble land was prepared for the barley and oats crop, it could be made to carry a fair number of stock until about March. A better crop of feed would always follow barley and oats than wheat, because the land would have two applications of super. Mr. R. Uphill thought the oats and barley rotation would prove too exhaustive for that district. Mr. A. Herbert always grew his hay crops on stubble ground. Mr. W. Dixon was of the opinion that crops on stubble land did not pay because the average season was to dry for them. He advocated sowing barley in the stubble for feed purposes. Mr. Sutton contended that if the barley was sown in the stubble the crop could be fed off until late in the season, and if the stock were taken out of the paddock one was very often able to reap a profitable crop.

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**WATERVALLE** (Average annual rainfall, 27.17in.).

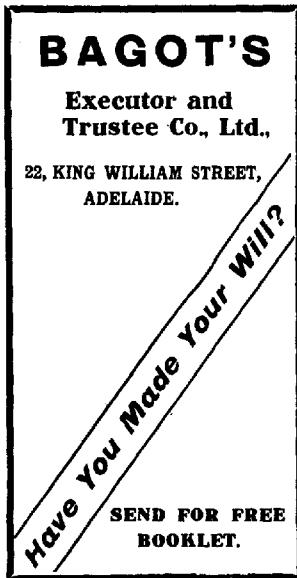
June 29th.—Present: eight members.

**PLANTING FRUIT TREES AND VINES.**—A discussion took place on this subject. Members were of the opinion that the trees and vines should not be planted at a greater depth than they had been in the nursery. A member asked if it would be possible to grub out and replant vines that had been planted too closely together, after they had been in the ground for a considerable number of years. It was agreed that the best plan would be to grub out every other vine, but not to attempt replanting, as it would be better to introduce new vines.

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**BALAKLAVA**, July 9th.—Mr. F. C. Richards, of the Department of Agriculture, visited the Branch and delivered a lecture, "The Work of the Agricultural Bureau." The Chairman (Mr. R. Butler) presented a shield to Mr. R. S. Goldney, the winner of the "Wheat Selection Competition."

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LONE PINE, July 27th.—Mr. A. C. Lehmann delivered an interesting address, "The Work of the Agricultural Bureau." A good discussion followed.

LYNDOCH, July 29th.—Addresses on the subject, "Co-operation," were delivered by Messrs Shannon and Connor, and an interesting discussion followed.

ROSEDALE, June 30th.—Mr. A. H. Lienert read a paper, "Care of Farm Implements." At a further meeting, held on July 31st, several questions of local interest were brought forward and discussed.

SADDLEWORTH, July 13th.—ANNUAL MEETING.—The annual report was presented by the Hon. Secretary (Mr. F. Coleman) and showed that during the past year nine meetings had been held with an average attendance of eight members. The Branch exhibited samples of wheat at the last March Show which were awarded second prize. Mr. A. Jamieson then read a paper, "The Engine on the Farm."

SALISBURY, August 3rd.—Mr. S. W. Bagster of Natal, South Africa (late of Salisbury), gave an interesting address on the methods of agriculture adopted in South Africa.

STOCKPORT, July 30th.—The Hon. Secretary (Mr. F. Watts) presented the annual report, which showed that eight meetings had been held during the past year. During the year a most interesting and educational visit had been paid by a large number of members to the Metropolitan Abattoirs. Representatives of the Branch had also attended the Field Trial held under the auspices of the Mallala Branch.

TWO WELLS, July 26th.—The annual report of the work performed by the Branch during the past 12 months was presented by the Hon. Secretary (Mr. H. W. Kenner), and the officers were elected for the forthcoming year. The Chairman (Mr. H. Dawkins), in a short address, urged members to take a keener interest in the work, and asked for their earnest co-operation in making the Branch a success. Mr. H. W. Kenner also spoke.

Mr. C. Verner tabled fine samples of navel oranges grown on his farm in the Port Gawler district.

### YORKE PENINSULA DISTRICT. (TO BUTE.)

ARTHURTON (Average annual rainfall, 16in. to 17in.).  
July 29th.—Present: 12 members.

PRESENTATION OF LIFE MEMBERSHIP CERTIFICATE.—The Chairman (Mr. W. Short) presented to Mr. J. Welch a life membership certificate of the Agricultural Bureau. The Chairman eulogised the work that Mr. Welch had done during his membership of the Branch, and mentioned that Mr. Welch had held the office of Chairman for 15 years, and during that time he had only been absent from two meetings of the Bureau.—The subject of flax growing was discussed, and several members intimated that they were carrying out experiments with that crop.

### BRENTWOOD.

July 1st.—Present: 11 members.

TRACTORS VERSUS HORSES.—In a short paper dealing with this subject, Mr. F. L. Carmichael said that in a season such as the present the tractor would be practically useless for working the ploughs and cultivators, because of the very wet nature of the ground. Even if a farmer did have a tractor, he believed it would still be necessary to keep horses on the farm. At the present time the price of a tractor was approximately £550. A team of horses could be purchased for about £200, and if one or two mares were kept, one should have no difficulty in maintaining the strength of the team. In the discussion that followed, members were of the opinion that the tractors would have to be considerably improved before they superseded horses in that district. The Hon. Secretary (Mr. G. L. Tucker) presented the annual report, and the officers were elected for the coming year.

### KILKERRAN.

July 29th.—Present nine members and two visitors.

INAUGURAL MEETING.—The first meeting of the above Branch was held in the local hall, when the Chairman (Mr. S. Keightly) read an article, "Hand-power

**Shearing Machines.**—An interesting discussion followed, in which Messrs. Kock, Geater, Gregory, and Wakefield took part.

**MAITLAND** (Average annual rainfall, 20.08in.).

August 7th.—Present: 11 members and one visitor.

**FALLOWING.**—Mr. O. W. Jones contributed a paper on this subject. The three objects of fallowing were, he said, the conservation of moisture, the preparing of a suitable seed bed, and clearing the land of weeds. Long experience had taught the farmers that attention to these points was necessary, the scientists had found that by proper treatment of the land it was possible to conserve 25 per cent. of the year's rainfall until the following year. That explained why fallow land was by far the best last year. It was difficult to set down any hard and fast rule as to how fallowing should be carried out, but he recommended commencing as soon after seeding as possible. He would not use a plough with more than a 6in. or 7in. cut, the number of furrows depending on the size of the team. He recommended the narrow cut, because, when the land was rather dry, the narrow cut would break it up more finely than an 8in. or 9in. cut. Also, less draught was required to work it. Fallow should not be left too long before being harrowed, because after rain a crust was liable to develop on the surface. It should be harrowed as soon after ploughing as possible with a set of heavy harrows. After the first harrowing he would go over it again at right angles, that would bring the clods and rubbish to the surface. The land could then be left until about the middle of September, then, if the weeds were not too strong, it should be cultivated with a spring tine cultivator, which he considered a suitable implement for making a good seed bed, but if the weeds were too strong it should be skim ploughed. After cultivating, the fallow should again be gone over with a light set of harrows. He considered 2in. to 3in. deep enough for ploughing, and 1in. to 2in. for cultivating. During the discussion which followed, Mr. Pearce said that the practice was now becoming general to disc the fallow directly after harvest.

**MOONTA** (Average annual rainfall, 15.22in.).

July 31st.—Present: 15 members.

**THE DAIRYING INDUSTRY.**—In a paper dealing with this subject Mr. W. A. Edge said in many cases dairying, in that district, was carried out under adverse circumstances, chiefly on account of the shortage of suitable land and the prohibitive price of water, which made it almost impossible for the dairy farmer to irrigate fodder crops. There was a great diversity of opinion as to what was the best hay for the cows; wheaten or oaten. His verdict was in favor of oaten. His opinion was that the oaten hay was more easily digested by the cattle. With the wheaten hay one often noticed that the grain passed through the cow undigested; such, however, was not the case with the oats. It was not a wise policy to feed inferior hay to the cows, because bran and pollard had to be added to such feed. The dairying industry was often spoken of as one of the greatest assets to the State, and he believed that more assistance from the Government should be given to the dairymen. The building of silos for the conservation of fodder during the summer and autumn months would, he thought, be a step in the right direction. He was very glad to notice that the British Government had contracted to purchase all surplus butter of a certain grade at 240s. per cwt, and there was no doubt that that would give the industry a decided impetus. In the discussion that followed Mr. J. Atkinson thought wheaten hay the best for cows, provided it was cut when the wheat was in blossom. Mr. T. G. Cliff did not think that their district was a suitable one for dairying. If the dairy farmer was to make success of his undertaking it was essential that plenty of water should be available for the irrigation of fodder crops. Messrs. Brinkworth, Middleton, and Wearing agreed with Mr. Cliff.

**DOWLINGVILLE**, July 29th.—Mr. F. Lock read an interesting paper, "Preventing Sandy Soil from Drifting," and a lengthy discussion followed.

**KADINA**, August 6th.—The resolutions to be moved at the forthcoming Congress were discussed. Mr. W. T. Correll presented a paper, which was held over till next meeting.

## WESTERN DISTRICT.

CUMMINS.

July 27th.—Present: six members and four visitors.

**THE FARM GARDEN.**—In a short paper under the heading "Amateur Gardening," Mr. J. Eckert recommended preparing the land during February. Next, a good dressing of well-rotted stable manure should be applied, and after the first rains had fallen the land should be worked to a depth of at least 15in. If the plants were all the same size at the time of planting out very little attention, other than that of weeding and hoeing, would be required. He had found it a good plan to place fowl manure around cabbages and cauliflowers just when the heart was commencing to form. To get the best results from turnips, he recommended sowing the seed in drills, and then thinning the plants out to a distance of about 4in. Carrots, parsnips, and swedes could be treated in the same manner. If the best results were to be secured the same kind of crop should not be sown on the same piece of land year after year.

## ELBOW HILL (Average annual rainfall, 11in. to 12in.).

July 31st.—Present: seven members.

**THE RABBIT VERSUS THE FOX AS A PEST.**—In a paper dealing with this subject Mr. J. Williams contended that the rabbit was more serious menace than the fox. It was quite true that the fox destroyed a large number of lambs, but one very seldom heard of it attacking a full grown sheep. He believed the lambs could be protected by housing at night with their mothers until they became strong enough to care for themselves. A serviceable portable yard could be made with 3ft. 6in. wire netting and iron posts, but a better plan would be to have a small paddock near the homestead in which the ewes and lambs could be kept. If the yarding was done by the children he believed it would give them an interest in the work of the farm. The same would also apply to the yarding of the poultry. From his observation he had come to the conclusion that the rabbit was more to be feared than the fox, and he doubted very much if any farmer was able to give a reliable estimate of the damage done in one year by the former pest. In the discussion that followed Mr. G. Wake thought the foxes were doing the most damage. He believed that it was more difficult to deal with the fox than with the rabbit. Mr. Chilman said the fox was the lesser of the two evils. The foxes were easily poisoned, and when one was caught the trouble was very often relieved for some time. Mr. Cowley was of the opinion that the only successful way to deal with the rabbit was by systematic destruction. Mr. Cooper thought the fox was responsible for more damage than the rabbit. The Hon. Secretary (Mr. P. G. Wheeler) said the fox did a certain amount of good work in killing a large number of rabbits. Mr. H. H. Wheeler thought if the regulations dealing with the destruction of vermin were enforced to the full letter of the law there would not be so much trouble with the rabbits.

## GREEN PATCH (Average annual rainfall, 26.56in.).

July 26th.—Present: 10 members.

**EARLY AND LATE LAMBS.**—Mr. T. Proude, who initiated a discussion on this subject, said he had not had any experience with late lambs. His ewes always lambed during mid-winter, and he realised that the wet and cold weather made a considerable reduction in the percentage of lambs. Mr. Hyde had experimented with early and mid-winter lambs, but in his opinion the late lambs were not best for that district. Mr. P. Sinclair spoke in favor of late lambs. Mr. Schwerdt asked if any member had any experience in giving sheep salt. The general opinion of members was that if pieces of rock salt were placed near the trough, the sheep would lick it readily. The Hon. Secretary (Mr. R. Sinclair) read the annual report, and the officers were elected for the ensuing session.

## KIMBA.

July 11th.—Present: 12 members.

**BENEFITS TO BE DERIVED FROM MEMBERSHIP OF THE AGRICULTURAL BUREAU.**—The first meeting of the Kimba Branch was held in the local hall, when the Hon. Secretary (Mr. A. Mitchell) read a paper on the above subject. He said the Agricultural Bureau was an institution organised for the benefit of the man on the land. Through the medium of the *Journal of Agriculture* members were kept

advised of the latest experiments on all matters relating to agriculture. He impressed on members the exceptional opportunities the Bureau afforded of keeping the farmers in touch with the expert officers of the Department of Agriculture, and urged all members to take a keen and thoughtful interest in the work of the Branch.

#### ROBERTS AND VERRAN.

July 26th.—Present: nine members.

**POULTRY ON THE FARM.**—“One who studies poultry-keeping, even to a very small extent, must come to the conclusion that it does not really form a profitable investment to simply turn a batch of fowls loose on the farm,” said Mr. A. T. Cowley, in a paper entitled “Poultry on the Farm”; “throw them heaps of grain when you have plenty and nothing when you have not; let them scratch and tear at haystacks, seed wheat bags, horses’ feed boxes, or anything else of a damageable nature, from which they may hope to extract food for themselves in small proportion to the damage and waste resulting from their efforts; to let them roost wherever they choose, or, as in some cases, offering them no choice of a perch more suited to their requirements than implements and harness; to be content to let them lay where they can, under adverse conditions; sit when and where they like, hatch whatever they will, rear as many chickens as can escape the ravages of preying enemies with no further protection than the feeble fury of a ‘‘clucky’’ hen, and, particularly, to continue such practices beyond two or three seasons; for, given good, strong, well-bred stock to begin with, under the generally healthy conditions of free life—roaming where they will, getting plenty of insects and green feed in season, fowls may appear to do quite satisfactorily for a time. How best to improve upon the method described with the means at our disposal is naturally our first question. Any method which involves more time in handling or expense in feeding must suffer in turn a greater margin of profit.” The number of eggs laid by each bird per annum represented the main and almost exclusive income. Hens could lay several times as many eggs per year if they were bred and fed to lay and were not kept too long. Breeding, feeding, and culling were the points demanding attention with the expenditure of time and money. Included under the heading money there would be grain or other produce of the farm which, if not retained for poultry feeding, could be marketed or turned to profit by other means. The disposal of culs should at least pay for the time and expense involved. Breeding and feeding were the two points which had to be studied by the man who would possess the most profitable type of laying hen. Provided one had the required pens, the mating of the birds was not a very difficult matter. The hatching and rearing of the chickens demanded a great deal of time in order that any measure of success could be achieved. Thoroughness was absolutely essential. Hatching could be done with about equal success by either hens or incubator, but if one preferred to hatch by hens he would first have to breed hens for the purpose. A first cross between a heavy and light breed he thought generally successful. It should be remembered that whilst breeding “broodies” one was probably not breeding layers, although, with proper care good layers, as well as good sitters, could be selected. Hens were not successful for rearing chickens in that district, owing to their inability to protect the chickens from native and imported enemies. Hand-fed chickens should not be given sloppy food, such as soaked bread, pollard, &c., when young. Dry, cracked grain, either wheat, oats, or both, would be practically all they would require, with the addition of a supply of clean water, charcoal, and sand. Pens and artificial brooders should be kept clean. Lamp heated brooders were not necessary if the chickens were gathered into a box under a suitable brooder and placed in a warm room at night. After about two or three weeks, or earlier in warm weather, they could be left out at night in lots of 40 or more with a brooder in a well-covered shelter. He had found it necessary to have the chicken pens netted over the top as a protection against cats and birds. Pullets, in a yard containing trees, would leave the roosting shed, especially after being frightened by cats, and roost in the trees, and in the morning some would fly down outside the fence; that would teach them to fly over at will. He was strongly of the opinion that small covered in pens would have to be provided if he was to continue

poultry raising. He had about half the number of hens now that he had three years ago, due, partly, to being unable to give sufficient time to breeding activities, but mainly through the ravages of foxes and cats. In the discussion which followed, Mr. F. Masters wondered whether it paid to spend so much time on a side line as was needed for the profitable management of poultry. He considered there would be too much loss in marketing the produce to make poultry profitable in that district. Mr. C. Kunst favored heavy breeds crossed with a light breed, preferably Rhode Island Reds crossed with White Leghorns. Mr. H. M. Imhoff would not keep more fowls than necessary to supply household requirements.

#### TALIA.

August 2nd.—Present: 10 members and visitors.

CARE OF FARM MACHINERY.—In a paper on this subject Mr. F. J. Wheaton said present day machinery was so expensive that it behoved the farmer to give it every care and attention. A substantial implement shed was essential if the machines were to be protected from the weather. If a coat of paint was given to the machines every two years it would prevent the iron from rusting and also preserve the woodwork. Lubrication was a most important point, and all the bearings should be thoroughly examined several times a day. He believed if the farmers were to keep the nuts and screws on the machine tight there would not be so many breakages. All bearings should be properly adjusted before the implement was taken out into the field. He strongly believed in overhauling the machine at the end of the season's work and having worn bearings replaced with new ones, and everything put in order in readiness for the coming season.

#### YADNARIE (Average annual rainfall, 14.09in.).

July 28th.—Present: 11 members and visitors.

BLACKSMITHING ON THE FARM.—In the course of a short paper dealing with this subject Mr. W. O. Kruger said a set of tools, to enable the farmer to do many of the blacksmithing jobs on the farm, could be purchased for about £30. The shop itself should be of fairly large dimensions so that any of the larger implements could be repaired in the shop. The following tools were recommended:—Forge, anvil, vice, hammers, drilling and thread cutting outfit, chisels, punches, emery wheel, &c. The farmers in that district should be able to provide their own fuel by burning charcoal. One often heard farmers say that they did not have the time for blacksmithing, but he believed that less time would be taken in doing the repairs than taking jobs to the local blacksmith. He firmly believed that a blacksmith's shop on the farm would be the saving of considerable time and money, especially during the busy seasons of the year. In the discussion that followed Mr. O. Forbes said there was no doubt that the erection of a blacksmith's shop was a valuable asset to the farmers, and he believed that with a little practice farmers would be able to effect many of their implement repairs. Messrs. Spriggs, Jericho, and Heir also spoke and agreed that the farmer would save much valuable time if he erected a blacksmith's shop on the farm.

#### YANINEE.

July 31st.

STARTING AND STOCKING A NEW SELECTION.—“The first move should be the selection of a suitable site for the homestead,” said Mr. T. Nottle in a paper under the heading of “Starting and Stocking a New Selection.” Careful consideration should be given to position, drainage, and attractiveness, and an area of eight or 10 acres reserved for the homestead and its surrounding buildings. A team of six horses, plough of medium weight, harrows and drill would be required to work about 200 acres of newly cleared land. He favored the purchase of large implements, with the object of being able to deal with larger areas of land as the work of clearing progressed. For the first few years he suggested cropping the land on five years' system of rotation—two crops of wheat, oats, grazing, and fallow. Recent years had proved the wisdom of conserving cocky chaff, yet there was no doubt that the harvester was a great labor saving machine, so that the choice of harvesting machinery rested

entirely on the farmers. If more than one pair of hands was available for assisting in the work of the farm two cows could be kept, and under ordinary conditions they should be able to keep the household supplied with milk and butter, and help to pay the expenses in connection with the upkeep of the household. Poultry was another profitable side line, and he favored a cross between a white leghorn and a black orpington as one that would serve the double purpose of supplying eggs and meat for the table. A few pigs could also be kept. As soon as circumstances permitted, the farmer should give his attention to the keeping of sheep, and if the system of cropping previously mentioned in the paper was carried out the household should be kept supplied with fresh meat all through the year. The laying out of a small fruit and vegetable garden was also well worth consideration.

#### YEELANNA.

July 31st.—Present: 14 members and seven visitors.

FALLOWING.—Mr. H. Glover, who contributed a paper on this subject, recommended any make of plough that would take a "P" share for fallowing the land of that district. A five-furrow plough was quite large enough to work in their class of soil, because it took 10 horses to do the work comfortably. The plough should be one that jumped very freely, especially when more draught was added to cut the bushes. The foot should be set to make the share work on a flat bottom so as to pull out as many stumps as possible and destroy all the rubbish. The furrows should be from 20in. to 24in. apart in order to give room for the rubbish to clear itself of the plough. He thought 4in. about the right depth to work the loamy soils of their district. The fallow should be cultivated in the spring or worked with a set of heavy harrows. It was necessary to keep the harrows free from rubbish and stumps to prevent them from brushing over the surface of the soil. He was of the opinion that harrowing was most beneficial after cultivating, because at that stage it did much towards the conservation of moisture.

WUDINNA, July 31st.—The meeting took the form of a "Question Box," when several subjects of local interest were brought forward for discussion.

#### EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

GERANIUM (Average annual rainfall, 16in. to 17in.).

July 3rd.—Present: 16 members.

POINTS ON FERTILISERS.—In the course of a paper dealing with this subject, Mr. J. Hughes said that lime was one of the oldest known fertilisers, and he looked forward to the time when every farmer who had any form of lime on his property would be able to use it and avoid the expense of purchasing so much superphosphate. Under natural conditions lime generally occurred as carbonate of lime, in the form of chalk, limestone, marl, and other substances. Gypsum was also another form of manure in which lime was found. Quicklime was a base capable of neutralising acids. It also absorbed and combined with water, thereby forming slaked lime. It absorbed the carbonic acid from the air, and combined with it to form calcium carbonate, and for that reason quicklime should be exposed to atmospheric conditions as little as possible. Lime also helped to bind sandy land together, and had the opposite effect on land of a heavy or clay nature. Lime was one of the essential constituents of the soil, for without it the land would not produce good crops. Soils containing a considerable quantity of organic matter responded readily to an application of lime, and the insoluble reserves of nitrogenous and potassic materials in the soil were made available by the presence of lime. It would be found that lime would sink rapidly into the subsoil. Newly drained or reclaimed land required lime. It facilitated the circulation of fresh air in the soil, and made the grass more palatable to stock. Farmyard manure should not be mixed with lime if the best results from such applications

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were to be obtained. Lime neutralised the acids in sour soils, and caused such plants as sorrel, which thrived in those classes of soil, to disappear. In the manufacture of superphosphate a chemical process was used, by which some of the calcium in the phosphatic rock was extracted, thus removing some of the retarding agent. The more calcium extracted, the greater solubility of the super, and a soluble fertiliser was one that did its work quickly. The super was prefixed to phosphate of lime to denote that it contained more acid than the lime could hold. If lime was added to the super, it would combine with some of the acid and form a non-acid form of precipitated phosphate. In such a form it would not be soluble in water, but it would still be available for plant food, although its action would not be so rapid. Rain dissolved the soluble phosphate in super at once, and it was thus evenly distributed all through the soil. Super should not be mixed with nitrate of soda. Bone super was manufactured from bone ash, i.e., the residue from burnt bones, Peruvian guano, one of the most valuable fertilisers, contained nitrogen, phosphorus, and potash—the three foods required by all plant life. Superphosphate always returned the best results when the soil to which it was applied contained a fair quantity of lime. Potash usually existed in the manure in the forms of sulphate of potash and muriate or chloride of potash. A ton of stable manure should contain about 12 lbs of potash as well as other valuable constituents, but the potash in that manure was not directly available for plant life. He believed it would be a profitable proposition to make a hole in a piece of clay land near the stable, into which the stable manure could be thrown and kept in a moist condition through the summer months. If that was done only a slow decomposition would take place, and in the spring of the year the manure could be used as a dressing for the vegetable garden or a plot of lucerne. Nitrate of soda should not be applied except in districts where the land was of a moist character; 1 cwt. of nitrate of soda contained as much nitrogen as 1½ tons of rich farmyard manure. Nitrate of soda was very much the same as other plant foods, because sometimes a small dressing applied to soil which contained a large proportion of nitrogen in an organic form would increase the yield of the crop 200 per cent. or 300 per cent. Sulphate of ammonia contained about 20 per cent. of nitrogen; it was slower in its action than nitrate of soda, and was a by-product of coal gas manufacture. Speaking of salt, the speaker said it should be borne in mind that salt contained 60 per cent. chlorine, a substance that was poisonous to plant life, and it should never be applied just before or during the growing period of a crop. It could be mixed with farmyard manure to prevent the escape of ammonia. He believed that the sandy land of their district would benefit by having sulphate of iron mixed with the manures that the farmers were in the habit of using.

The Hon. Secretary (Mr. Young) presented the Annual Report and the officers were elected for the coming year.

#### LONE GUM.

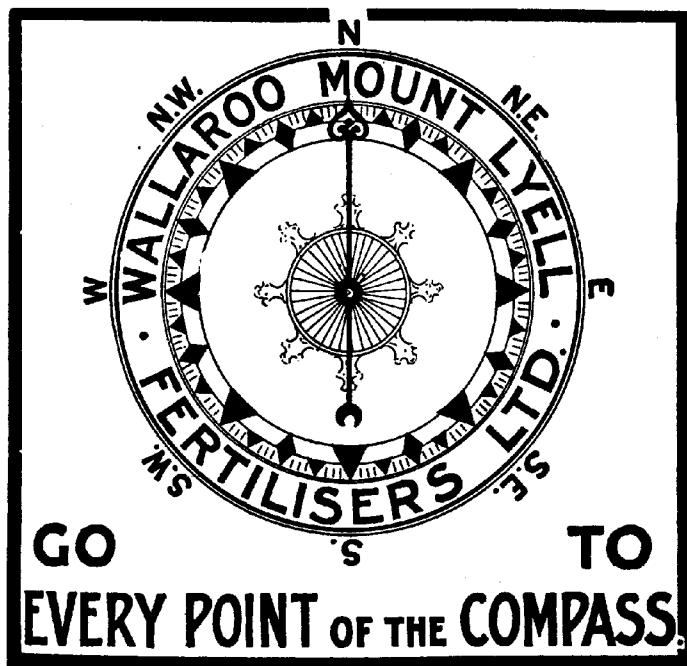
July 13th.—Present: 16 members and visitors.

TREATMENT OF YOUNG CITRUS TREES.—Mr. F. R. Arndt, of the Berri Branch, read the following paper:—Selecting the land.—Owing to the fact that citrus, as well as other varieties of fruits, do not do equally well in every kind of soil or situation, it is first of all necessary for a prospective citrus grower to select a piece of land having characteristics best suited to their requirements. Regarding the class of soil best suited for citrus trees, experience has shown that loose, rich soils which have perfect drainage have given best results. This does not mean that citrus trees will not grow on rather heavy land. On the Adelaide plains, as well as on the river flats at Renmark and Berri, oranges and lemons do remarkably well on rather heavy clay soil; but young trees are somewhat difficult to start in such soil, and their growth for the first three or four years is slow. The deeper class of soils of the Murray uplands may be said to be practically ideal citrus land. Land of this nature is, in its native state, usually covered with pine, needlebush, or big mallee, and consists of a red sandy loam, from 3ft. to 5ft. in depth, underlaid by a loose, greyish-brown calcareous marl. Local experience has shown that citrus trees do not thrive on land having limestone, either in the form of rock or rubble, within a few feet of the surface, as such land is often full of salt, or on land underlaid with a whitish, putty-like clay. The alkali

problem is probably the most serious danger that the citrus grower has to face upon the Murray uplands, as such salts as sodium chloride (common salt), sodium sulphate (Glauber's salt), and magnesium sulphate (Epsom salts) are highly detrimental to all varieties of citrus trees. Therefore, land likely to develop alkali trouble, such as shallow soils under 3ft. in depth resting upon limestone, or upon a hard or tenacious subsoil, should be avoided by the planter. However, as the presence of alkalies in a soil is due to defective under drainage, by choosing deep land with a loose subsoil, no damage from alkali trouble should be experienced. Situation not Subject to Heavy Frosts.—Although, on the whole, severe damage to citrus trees due to frosts is but a rare occurrence on the Murray Valley irrigation settlements, there are yet certain situations subject to comparatively heavy frosts which should be avoided by the planter. It is a matter of common observation that frosts are the most severe in valleys, hollows, and low areas, while the adjacent hillsides of elevated lands remain comparatively untouched. This is because the cold air from the hillsides, being heavier, drains off into the lower levels and settles there, while the warm air rises to replace it. This interchange of air continues until frost occurs in the lower levels, while the higher lands escape. A citrus grove should therefore never be located in a hollow, basin-shaped depression, or in a narrow gully, but should the soil be suitable, is best situated on land that is elevated above the surrounding country. The Ideal Position.—The ideal position of a citrus grove is on a slope facing the east, as experience has shown that the rays of the rising sun are less injurious to frosted plants than they are if the sun is some distance above the horizon before it strikes them; while the slope of the ground will allow the cold air to drain off into lower levels. Of course, a situation facing the east, although desirable, is not essential for the location of the grove, the one thing necessary being that the plantation has perfect air drainage, so that the cold air can drain away; and therefore a position on sloping ground is the best. One thing the planter should be careful of, and that is to plant no belt of evergreen shelter trees along the boundary at the lowest portion of the grove. Such trees, being in full leaf in winter when the frosts occur, prevent the cold air from passing freely away and force it back upon the plantation, thus causing frost on the lower portion of the grove. Should a breakwind be required along the lower boundary, it should consist of deciduous trees. Good Drainage Essential.—As all varieties of citrus trees are impatient of stagnant water about their roots, they should only be planted on land having perfect drainage, and therefore shallow soils or very heavy soils whereon the water stagnates, must be avoided by the planter. As one of the greatest drawbacks on an irrigation area is the menace of seepage, land that is full of hollows, or that has a heavy subsoil, should not be chosen. Seepage is caused by the irrigation water running along the subsoil and coming to the surface where this subsoil is shallow or where it meets the surface of the ground. Blocks situated on sandy rises which peter out on to clay flats are liable to develop seepage, which will show itself along the line just above where the clay and sand meet. Land that contains hollow, basin-shaped depressions should also be avoided, for unless the subsoil of such depressions consists of deep sand, the water from the surrounding higher lands will soak into the hollows and kill the plants it contains. A block of land having deep soil of a uniform nature, with a not too tenacious subsoil, and having an even slope, is about as good a proposition as can be obtained. Irrigation Channels.—After the land has been grubbed, graded, and ploughed, the next thing is to have the irrigation channels put in from which the land is to be watered. The channels are usually made from lime or cement concrete, but irrigation by means of reinforced cement piping has, within late years, been introduced and given satisfactory results. The greatest care should be exercised as to where the channels are put down. Upon the positions of the channels depends the length of the rows of trees to be watered. Experience has shown that in loose, sandy loam rows five chains in length are long enough, and that on no consideration should rows over six chains long be watered in one section on this class of land. As on the loose, sandy rises, of which the irrigation settlements chiefly consist, the furrow system of irrigation is practically the only one that is used, it follows that the water is flowing for a considerable time past the first trees of a row before it reaches the last one; therefore, the longer the rows are, the longer will the water take

to reach the end. On very long rows the first tree will have had too much water before the last tree will have had enough, and the top of the land will in time become water-logged, to the injury of the trees. In any case, the surplus water will soak down the slopes along the subsoil, and should this, in any case, come close to the surface of the ground, the water will come up there in the form of seepage, bringing the alkalies contained in the soil with it, and killing the plants in the vicinity. Having short rows means, of course, much channelling, which greatly adds to the first cost of the place, but it will pay in the long run in the ease with which the land can be watered, and in the satisfactory growth of the trees. Another matter in which care has to be exercised is to see that the channels are so situated that the grade of watering is not too steep or too level. On sandy rises a fall of one foot to the chain is sufficient, while anything under 4in. to the chain is too little. It is a mistake to water straight down steep slopes, as the force of the water washes deep gutters in the land at the top. The washed-out soil carried down by the water silts up the furrows farther down the slope, causing the water to spread over the land at that place, so that very little water reaches the end of the rows. Where the land is hard, as on most of the flats, the grade along which to irrigate may be considerably less than upon sandy rises, as the soil absorbs the water far more slowly than is the case with the looser land. The danger of watering along an almost level grade on loose, sandy land is that, through the porous nature of the soil, the water sinks in so rapidly that the top ends of the rows get too much water before the bottom ends have had sufficient. Unless the drainage of the land is excellent, such a system of watering will, sooner or later, cause seepage to appear lower down the slopes. Thus it is not safe to water with a fall of less than 4in. to the chain on sandy rises—from 6in. to 9in. being the most convenient grades. Varieties to Plant.—The Washington Navel is the most extensively planted of all varieties of citrus grown in the Murray Valley. As previously stated, this variety thrives exceedingly well under the conditions existing along the banks of the Murray, and with the exception of occasional unfavorable seasons, is a consistent bearer of heavy crops of well-flavored and highly colored fruit. Being so well suited to the district, this variety is likely to remain the chief kind grown for many years to come. The Thompson's improved navel has also been planted to a limited extent, but whether it will be as profitable a variety to grow as the Washington navel, experience has yet to be proved. The Valencia Late is another variety that has been planted to some extent within recent years, and is proving itself suited to Murray Valley conditions. This variety does not ripen until the navel crop has been practically disposed of, and although hardly of the best quality, comes on to the market when bare of citrus fruits, and so realises satisfactory prices. The varieties of mandarins that have given good results are:—Oonshui (early, but does not keep well), Dancy's (highly colored, good bearer), Beauty of Glen Retreat (little later than Dancy's, good bearer). The lemons usually grown are Lisbon (heavy winter cropper) and Villa Franca (good bearer, ripens some fruit during summer if autumn flowering is not destroyed by frosts). For the purpose of marmalade making the Poorman orange is grown to a limited extent. Citrus Stock.—Another thing the planter will have to consider, and that is the stock upon which the young trees are budded. In Australia citrus trees are usually budded upon Seville, sweet orange, and lemon stock. Of the three the Seville stock makes the hardiest tree, and American and Australian experience seems to be at one in this matter. The Seville is not so liable to collar rot as the lemon and sweet orange, and can therefore be grown on the wetter land than either of the other two, and has proved itself able to withstand floodings and to grow in fairly moist situations. The Seville as a stock causes slow growth to the variety budded upon it, makes for a rather bushy tree, and the fruit, although of good quality, is somewhat smaller than that grown either upon sweet orange or lemon stock. Sweet Orange Stock.—The sweet orange is a stock that makes for quick growing, vigorous tree. On a good, loose, loamy soil, where water does not stagnate around the butts of the trees, and where the drainage is good, the sweet orange stock gives good results. It gives a large and vigorous tree, and induces a good crop of good-sized fruit. Owing to a widely spread belief that the sweet orange is more resistant to the effects of moisture and to the baneful influences of many of the alkalies dissolved by irrigation water, many growers prefer it as a stock to the rough

lemon. Rough Lemon Stock.—As a stock, the lemon has the reputation of being the least hardy of the three varieties under consideration, and is usually held to be more liable to collar rot, impatient of much moisture around the roots, and more likely to suffer from the attacks of alkalies than the other two. Therefore, trees on this stock should not be planted on soil likely to be flooded by rain or irrigation water; but will succeed on dry situations having good drainage. Rough lemon stock is the favorite stock for citrus trees at present used in Sydney, having practically superseded the Seville and sweet orange for that purpose, and is there known as the "Crintronella" stock. This variety has also been extensively used as a citrus stock along the Murray Valley, and so far has given good results. The rough lemon stock gives rise to a tall, vigorous tree, with large sized fruit, and trees budded upon it grow very quickly and come early into bearing. In the writer's plantation Washington Navel trees, budded upon sweet orange and lemon stock, were planted side by side at the same time and in the same class of soil, and at the present time (eight years after planting) not only have the trees on the lemon stock beaten the others in fruitfulness, but in quality of fruit—size, thinness of rind, and sweetness—as well. However, this position may not be maintained in the future, as the trees on the orange stock steady down in growth and yield heavier crops, but it bears out what appears to be the general experience—that the lemon stock is conducive to early fruiting. Briefly stated, sweet orange and rough lemon stock may be safely used on dry situations having loose soil and good drainage, while sour stock is best suited to wet land, or land likely to be flooded. Planting.—After the land has been grubbed, ploughed, graded, harrowed, channelled, and it has been decided what to plant, the ground is next set out for planting. The



length and grade of the rows of trees and vines necessary for their satisfactory irrigation has already been dealt with. Where the land is hilly or undulating it is often impossible to water all the land of a holding with the same grade, therefore the orchard has often to be laid out in two or more sections, each section having a different grade along which to water. This somewhat spoils the appearance of uniformity of the plantation, but with our furrow system of watering this is often unavoidable, as the success of the orchard depends upon its efficient irrigation, so all other considerations must give place to this. Citrus trees are usually set out in orchard form varying from 20ft. to 24ft. apart. As many varieties of citrus—and especially the Washington Navel—are of spreading habits, they should on no consideration be planted closer than 20ft. The standard distance for planting deciduous trees has for many years been 20ft. apart on the square, and many citrus plantations have been laid out according to this standard. However, in very rich, loamy soil, wherein the trees make heavy growth, their branches are apt to get close to each other when the trees reach maturity, thus interfering with the cultivation of the plantation, and, therefore, in this class of soil it is better to plant the trees from 22ft. to 24ft. apart. Pegging Out.—After the grade and length of the rows, as well as the distance at which it is intended to plant, has been decided upon, the ground has next to be pegged out for planting. This is usually done by means of a wire-planting line that has either metal or cloth tags inserted at regular intervals at the distance at which the trees are to be planted. In using, the line is drawn tight, and a peg is driven into the ground at every tag. Where the land is fairly level, or has but a gentle fall, the channel may be used as a base line and the rows go off at right angles from it; but where the rows, in order to have the correct grade, branch off from the channel at other than right angles, then the line drawn from the channel at the angle it is intended to water should serve as the base line, and all other measurements should be taken from this. Owing to mistakes made in the laying out of a plantation remaining for the orchard's existence, those without previous experience should obtain the aid of an experienced man to help them with this work. Planting Out.—Citrus are generally planted along the Murray Valley during the first two weeks of September. Planting during the month of May has something to recommend it, as it gives the trees ample time to make new roots before the hot weather sets in. Trees planted in May have to receive a planting irrigation, and should be protected by hessian or other means from the winter frosts, and if the winter is dry, as is often the case, will have to receive a winter watering. As the pumping plants of most of the irrigation areas are not at work during the winter months, the difficulty of obtaining a late autumn or winter irrigation has militated against the autumn planting of citrus, and makes September planting the easiest and safest proposition. Citrus trees are received from the nursery in boxes packed in earth or damp sawdust, with the tops covered with hessian. If it is intended to plant within a few days of their arrival, the trees, if they are in good condition, may be left in the boxes until planting time, care being taken to place the boxes in a cool and shady place, the tops kept covered up, and ample supplies of water given to the roots and tops. If it is not intended to plant for some time, or if the leaves of the trees are limp, the trees should be taken out of the cases and heeled in in a shady place. Plenty of water should be given to both the roots and foliage, and the tops left covered with hessian. Before planting the roots should be shortened back and all broken roots removed. In cutting back the tops it is not advisable to head the trees too low. Clean stems of about 18in. are more desirable than shorter stems, on account of the limbs of low-headed trees, being nearer the ground, thus getting in the way of the cultivator. Besides this, the fruit of low-headed trees is apt to come in contact with the earth, and is therefore liable to be spoiled. Trees having long, clean stems should have their stems protected by straw or hessian loosely tied around them for the first summer to prevent injury from sun scald, which covering may be removed in early autumn. Trees that have been headed low in the nursery should have all drooping growth removed, and pruned to upward growing branches, and under all circumstances all unripe shoots should be cut off. Citrus are best planted with an irrigation, the water running along the furrows and being led into the holes while the trees are being planted. Care must be taken that the trees are not planted deeper than they stood in the nursery.

—if anything a little higher to allow settling—as citrus do not do well if deeply planted. When taking the trees out to be planted, the roots should be kept covered with a damp bag or piece of hessian, or carried with the roots in a tub of puddle until they are planted. Nothing is so injurious to young citrus trees as to have their roots exposed, even for a few minutes, to the influences of sun or wind. If the trees are planted before an irrigation, they must each be given a bucket of water immediately after planting, and the irrigation should follow in a couple of days. A good cultivation should follow especially close to the trees, which should be done with a forked hoe or rake to avoid cutting the roots. Irrigation.—Provided that the land is kept well cultivated, newly-planted trees do not require more than from 15in. to 20in. of irrigation water the first season. When once established and before they come into bearing, trees planted on sandy land can be kept in vigorous health on 15in. and under of irrigation water per annum. One of the greatest mistakes often made by newcomers on irrigation areas is in watering too heavily. On most of the irrigation settlements the regulations formulated by the governing authorities permit the individual irrigationist to use up to 24in. of water per acre; but these regulations are not always enforced, with the result that inexperienced irrigationists often put far more water on to their land than is good for it. Seepage, the greatest foe the irrigationist has to fear, is more often brought about by excessive or careless watering than by any other means. Experience has shown that 24-acre inches per annum is amply sufficient for vines and trees in full bearing, and that with good cultivation it is possible to obtain the heaviest crops with considerably less water than this. Cultivation.—So closely connected with irrigation as to be practically a part of it is the subject of cultivation. The irrigation of a piece of land is of little use unless it is followed by cultivation, as the water poured into the soil soon evaporates unless the surface of the ground is kept well stirred. Cultivation destroys the small capillary tubes along which moisture passes through the soil into the atmosphere, and by thus forming a blanket of loose earth on top, through which evaporation can only imperfectly take place, the lower layers of the soil are kept moist. Another result of cultivation is that by checking evaporation the formation of alkalis on the surface of the ground is prevented. In arid regions, such as the greater portion of the Murray Valley consists of, the rainfall has never been sufficient to leach much of the natural salts out of the land and to carry them away in the river water. When this land is irrigated some of the salts are dissolved by water. Capillary action draws the salt-impregnated water to the surface of the ground, where the water is evaporated and the salts left as a residue. As some of these salts are highly detrimental to plant life, being especially injurious when concentrated on or near the surface roots of fruit trees, it is necessary, were it for this reason alone, that the work of cultivation in the orchard should be of a thorough nature. During the early part of the season, while the weather is still cool, the cultivation of the whole of the orchard is not quite so essential as it is during the summer months. If cover crops intended for hay, such as wheat or oats, are grown in between the rows of young trees, these should occupy strips of not more than 6ft. wide, so that a two-horse cultivator can be driven along each side of the rows of trees. After such cover crops are mown, which will be either in October or November, the whole orchard should be cultivated or disc-harrowed, and kept well worked and free from weeds for the rest of the season. Where the land cannot be stirred by horse cultivation, such as near the stems of the trees, the land must be kept loose and weeds destroyed with the hoe. Young trees should receive special cultivation close to the tree, as the roots are not far from the stem, and the forked hoe, which does not go too deeply into the soil, is a very useful implement for this work. To ensure satisfactory growth in a young orchard too much care cannot be exercised in this work of close cultivation, as every weed is a pump drawing the moisture into the air that the young tree requires for its needs. Pruning.—As a whole no class of fruit trees require less pruning than citrus trees. At the time of planting the young trees should be cut down to about 18in. to 2ft.. When growth commences young shoots will spring out all along the stem. All shoots below a foot from the ground should be rubbed off, thus allowing a clean stem of at least a foot where the trees have been cut back to 18in. Where the trees

have been left 2ft. high a clean stem of 18in. should be left. Some years ago it was the custom to grow high-headed trees having a bare trunk of 4ft. or over. Experience having proved that high-headed trees are more liable to suffer from strong winds, more liable to have their stems injured from sunburn, and the fruit was not so cheaply gathered as from low-headed trees, some citrus growers went to the other extreme and headed their trees but a few inches above the bud. This made for a low bushy tree, with branches very close to the ground, which brought a portion of the fruit into contact with the earth, and with the limbs so low as to be in the way of horse cultivation. It was therefore found that a clean stem of about 18in. in height gave the best results. Citrus trees usually make from two to four growths during the season. The growth of young trees is often so rapid that it cannot support itself, and bends down until it touches the ground. It is not advisable to have the branches as low as this, as on frosty night the cold is greatest nearest the ground, and the fruit is liable to be frost bitten. Therefore, whenever the branches bend down too low they should be cut back to an upward bud at the place where the downward arc commences. The main branches of a citrus tree should have an upward tendency. The natural drooping habit of a citrus tree so trained will soon assert itself again through the formation of side branches, and through the weight of the fruit. Citrus trees that have become too dense in the head should be thinned out somewhat, so as to let in a little light and air, as darkness is conducive to the growth of insect pests. All dead wood should also be removed. All water shoots growing out of the old wood are best removed, as these often grow with excessive vigor, and by taking up a great portion of the sap of the tree rob the other branches of nourishment, thus making for a lopsided development. The best time to prune citrus trees is during spring and early summer, as if left too late in the season growth will often have taken place on shoots or branches that would have been pruned away at the spring pruning, thus resulting in waste of energy.

#### MINDARIE.

August 2nd.—Present: 14 members and visitors.

FALLOWING.—A short paper on this subject was contributed by Mr. Francis. The speaker said the principle reason for fallowing was to conserve moisture and sweeten the soil. He advocated working the land to a depth of 4in. In the discussion that followed opinions were divided as to the advisability of ploughing as deep as that mentioned by the speaker. Some members stated that if the land was worked too deeply there was a danger of destroying the seed bed and bring the sour soil to the surface. A general discussion followed on the working of the fallow to prevent drift during the summer months.

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#### MONARTO SOUTH (Average annual rainfall, 14in to 15in.).

July 31st.—Present: 11 members and four visitors.

GROWING AND HARVESTING PEAS.—Mr. C. Harper, who contributed a short paper dealing with this subject, said the best results from a crop of peas in that district would be obtained if the seed was sown about the last week in May. At least 1½ bush. of seed should be sown to the acre, and as soon as the drilling was completed the land should be rolled. In most cases he had obtained the best returns from seed sown on land of a sandy character. In order to prevent the peas from shedding he suggested cutting just before the crop ripened off. The peas should then be made into small cocks and carted into a round heap. He made a practice of running the sheep over the stubble, because there was always a certain amount of peas that fell to the ground during harvesting operations.

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#### MOOROOK.

July 31st.

PRUNING COMPETITION.—A successful pruning competition was held under the auspices of the above Branch at Mr. Sanders, jun.'s orchard. Mr. G. Beverley (Manager of the Pyap Estate) adjudicated and awarded the following prizes:—First, Mr. L. King; second, Mr. R. Ochernal. A large number of members and visitors were present.

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WAIKERIE (Average annual rainfall, 8.89in.).

July 30th.

CONSERVATION OF TIMBER ALONG THE RIVER BANKS.—Mr. W. G. Francis, in the course of a paper dealing with this subject, said, at the recent Conference of River Murray Branches of the Agricultural Bureau, a resolution was carried asking the Government to take steps to preserve the timber growing along the banks of the River Murray. He believed the aim of the Branches in passing that resolution was to endeavor to get the Forest Department to declare such areas along the River as Forest Reserves. No person should be allowed to cut wood except for fencing and fuel requirements, and each year new areas should be planted with good gum timber for future use. In some of their districts, during the last 10 years, the price of firewood had risen from 5s. per ton to 10s. per ton, and fencing posts that could be purchased for 25s. per 100 now cost £3. At the present time the irrigation settlements were using something like 10,000 tons of firewood per year. He believed that in the course of another five years 20,000 tons per annum would be needed to keep the pumps going.

#### WYNARKA.

July 3rd.—Present: 11 members and three visitors.

QUESTION BOX.—The meeting took the form of a question box, when several subjects of local interest were dealt with. The first question asked was, "The best treatment for old land covered with grass?" A member suggested that the land should be worked with a heavy disc implement in January, fire-raked in February, and then worked with a share plough after the first rain. The next question considered was as follows:—"What are the advantages to be obtained from grading wheat?" In the discussion that followed it was generally agreed that one secured a better sample of seed wheat, the ensuing crop would be kept comparatively clean, and there was the possibility of selling the seed at a higher price. One of the members asked, "What is the best depth to work back fallow

land prior to seeding?" It was stated that the final working of the soil need not be any deeper than the depth at which the seed was to be sown, as that would form a firm seedbed with a layer of loose soil on the surface. The next question submitted was, "Which is the best implement with which to work the fallow prior to seeding?" One of the members recommended a tyne cultivator, because it was not advisable to turn the soil. Another member preferred to use a skim plough. The question as to whether a cow, if spayed while in full milk, would remain in milk indefinitely, was put to the meeting. A reply was given to the effect that the cow would probably remain in milk for nine or 10 years. A member asked if the butter fat contents of milk could be increased by any particular method of feeding? It was stated that the butter fat could be increased by feeding. It was further mentioned that cocky chaff, oats, and bran was a better feed for the purpose than hay chaff or bran. One of the members did not agree with the reply given to the last question, and it was referred to the Dairy Expert (Mr. P. H. Suter), who replied as follows:—The percentage may only be increased permanently when a cow has been in very low condition and health, and then receives a nutritious food supply. It may also be increased temporarily by feeding special food; but this increase will not obtain for more than one or two days, when the cow will sicken and go back to normal or less than normal. If a cow is in very low condition the fat percentage will be below normal; but if in poor, but not low, condition, the fat contents in the lesser supply of milk will, in most cases, be higher than when the cow is in better condition.

BERRI, July 27th.—The Manager of the Berri Experimental Orchard (Mr. C. G. Savage) gave a report of the work done by the orchard during the last 12 months. The balance-sheet of the branch was presented and adopted, and a committee was appointed to arrange for next season's pruning competition.

CLAYPAN BÖRE, July 28th.—Mr. G. H. McBurnley read a paper, "Care of Farm Implements." A good discussion followed.

HALIDON, August 8th.—Mr. F. C. Richards, of the Department of Agriculture, attended the meeting and gave an address, "The Aims and Advantages of the Agricultural Bureau."

LONE GUM, July 27th.—The Manager of the Berri Experimental Orchard (Mr. C. G. Savage) visited the Branch, and read a paper, "Orchard Insects and Pests."

PINNAROO, July 29th.—The annual report was presented by the Hon. Secretary (Mr. P. H. Jones), and the officers were elected for the ensuing term. Mr. F. C. Richards, of the Department of Agriculture, then addressed the meeting on "The Work of the Agricultural Bureau."

TAPLAN, August 7th.—Mr. McMillan read a paper, "Go on the Land, Digger," and an interesting discussion followed.

#### SOUTH AND HILLS DISTRICT.

CHERRY GARDENS (Average annual rainfall, 35.03in.)

July 27th.—Present: 12 members.

CO-OPERATION.—In the course of a paper dealing with this subject Mr. H. Strange said he was a firm believer in the general principles of co-operation, but with regard to the sinking of a bore on co-operative lines there were several points that should first of all be taken into account. Using the following case as an illustration he said that, supposing two landholders had properties adjoining each other, and they sank a bore from which a good supply of water was obtained, the question as to what real claim the adjoining landowner had on the other landowner, or the land, or the bore would have to be settled. The owner on whose land the bore was situated was not bound to supply his neighbor with water, for there was no legal claim, but only a moral obligation, and he did not think it would be a wise policy to place too much trust on that. He had written the paper because he knew several of his neighbors were thinking of co-operating and sinking a bore on account of the heavy expense, but he strongly advised each gardener to sink his own bore, for while the initial outlay was heavy, no estimate could be placed on the value of an unfailing supply of water for the holding.

An interesting discussion followed in which Messrs. D. Ricks, C. Lewis, H. Jacobs, J. Tozer, and A. R. Stone thought the best plan was for each man to sink his own bore, notwithstanding the many benefits that accrued from many forms of co-operation.

IRON BANK (Average annual rainfall, 33in. to 34in.).

July 31st.—Present: six members and two visitors.

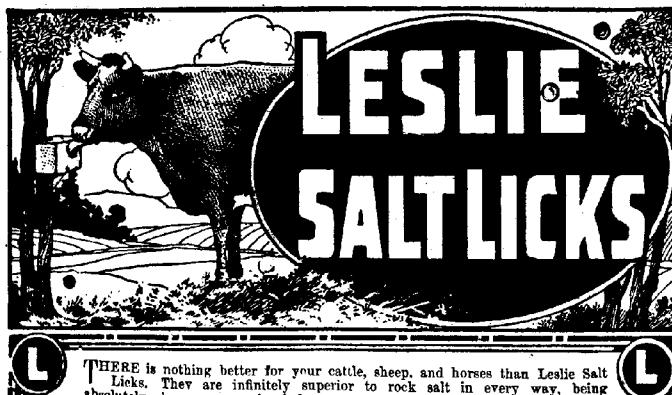
PLUM GROWING IN MOUNT LOFTY RANGES.—Mr. G. Pole read a short paper on this subject. He said one had to consider the best varieties that would fruit in succession. He suggested planting Rivers Early Prolific, Wright's Early, Magnum Bonum, Red Sultan, Angelina Burdett, and Green Gage on high land, because they were vigorous growers and shy bearers in good land. Jefferson, Kirk, and Yellow Egg plum were suitable for low land, because they had a tendency to shrivel during dry seasons. Grand Duke, Pound Seedling, and Coe's Golden Drop were suitable for both high and low land. During the discussion that followed, Mr. W. Coats said that to ensure the diamond plum bearing satisfactorily it was necessary to grow it from cuttings. He thought the Royal Gage and Early River varieties were good jam plums.

MOUNT BARKER (Average annual rainfall, 30.93in.)

July 28th.—Present: 62 members and three visitors.

PARTURITION IN THE COW.—Mr. L. Rankine read the following paper:—Labor in the cow is generally a slow process, birth seldom takes place under half an hour, and may run into many hours. The signs of approaching labor are:—The udder becomes hot, swollen, and painful. The ligaments of the pelvis give way, and are spoken of as falling in of the bones, and there is generally a thick discharge of mucous from the passage. The labor pains are shown by restlessness, pain, frequent change of positions, and soon after these symptoms, part of the internal membranes, appear (described by some as the water bag). This, in a normal presentation is followed by the fore feet and the head, with the chin resting on the knees. If it is found necessary to assist, the legs should be firmly grasped and a steady strain applied only when the animal is straining, for it is useless to pull when the cow is not assisting. As soon as the calf is dropped it is a good practice to ligature the cord near the naval; this is rarely done by farmers, who allow nature to take its course, and the cord dries up in a few days, but serious diseases often affect young calves through septic and disease producing organisms gaining access through the raw umbilical cord, especially if the calf is born in filthy surroundings. If the cow is in labor for some time and there is no appearance of a calf, the passage should be explored with the hand, and if the uterus is closed, or only partly dilated, it is advisable to give from one to two ounces of laudanum in a pint of water, then some time should be allowed for dilation to take place. Whenever work of this nature is attempted the attendant must have clean hands, short fingernails, and should use antiseptics freely. Any of the following will do, viz:—Lysol, carbolic, creodol, creosol, phenyle or Condy's fluid. It is also advisable to smear vaseline or olive oil on the hand and arm. Abnormal presentations and what to do:—If only one fore foot and the head is projected it is useless to exert force with such a presentation. After washing the hands carefully with antiseptics explore for the other foot. If you can locate it, secure the foot that is already out, and the head also, by means of a piece of cord or soft rope, place a noose over the fetlock of the visible foot, and a loop over the lower jaw of the head. When both are secured push them back when the straining ceases, if this cannot be done it may be necessary to elevate the hind quarters of the cow by a block and tackle with straps around the buttocks above the hocks. This tends to throw the internal organs forward and one has more room in which to work. Now find the foot that is doubled back inside, slip a noose over the fetlock, straighten it up into the passage by pulling on the cord, and cover the foot when doing so with the hand to prevent it tearing the uterus. Now that you have both feet and the head showing the cow can be assisted by steady pulling, but only when the labor pains are being exerted by the cow. It is nearly always advisable whenever a foot or the head is presented to secure it with rope or cord before pushing it back into the uterus. It is important to know

that for changing the position of the unborn calf, for example, lifting the legs, turning the head, &c., a difficult task may sometimes be rendered easy by considerably elevating the hind quarters of the mother for, besides throwing forward all the abdominal organs, it reduces the strength of the labor pains. If no tackle is available throw the cow on a steep bank or side of a hill, place the head downhill and have an attendant to hold her head down. Front feet, showing head turned down back or sideways.—In all these presentations the operator must know definitely the position of the young animal, and this can only be done by exploring. Nothing should be taken for granted, as many valuable cows are lost through ignorance of what is to be done and when strength should be applied. In this case secure the front feet by a cord and find which way the head is situated, if bent downwards the cow may be placed on her back, head downhill, and retained there by means of chaff bags, or held in position until the head of the calf is elevated to the normal position. If the head of the young one is turned to the right the cow should be thrown on the left side, and *vice versa*. It is distinctly understood that the hands and arms are absolutely clean, washing them with antiseptics and also lubricated before exploring. Head only showing, neck in the passage, and the fore feet inside.—To correct this presentation commence by securing the head with a cord on the lower jaw, then, if possible, press the head back inside. If this cannot be done standing, throw the cow and elevate the hind quarter. When the head is returned inside bring up the two fore feet by careful handling, then pull on the rope attached to the head. Perhaps the head cannot be returned after well oiling and carefully pressing, with the hind quarters of the cow elevated, which may occasionally happen when a cow has been neglected or the calf may be dead and much swollen; the head must be amputated and enough loose skin left to allow of a cord being inserted. Hind legs, presentation.—It sometimes happens that calves are born with the hind legs presented. In this case the exact position of the young animal should be noted, and while assistants pull down steadily while labor is on, the person who knows exactly the position of the calf should direct operations. There are many abnormalities that



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may present themselves at calving, but enough instances have been shown to enable the dairyman to act and relieve the cow. As, before mentioned, cows are very hardy in connection with calving, and in some instances have taken a day or two to produce their young. Therefore, it behoves a dairyman who values his cows to think well before he acts, to quite understand what has to be done, when and where pressure has to be exerted; for brute strength is cruel and valueless if used where it is not required, as many cases have proved fatal owing to ignorance and force being used. For instance, a cow may be trying to give birth to twins and force is used on the leg of each calf, or it has happened that a front and hind leg have been pulled on together. In quoting these examples it is intended to firmly impress that the man who makes the internal examination and knows the exact situation must direct operations where force or pressure is to be exerted. It is easily to write how to relieve these presentations, but in actual experience it is very hard and strenuous to work against the natural labor pains in cattle.

**NARRUNG** (Average annual rainfall, 17in. to 18in.).

June 26th.—Present: 23 members and visitors.

**ANNUAL MEETING.**—The Hon. Secretary (Mr. W. T. Laurie) read the annual report, which showed that nine meetings had been held with an average attendance of 12 members. After the business of the Branch had been transacted the meeting took the form of a social evening.

**CARE AND MANAGEMENT OF FARM STOCK.**—Mr. J. B. Steer read a paper on this subject. The speaker said he intended to deal with those classes of stock that were handled by the farmers in the Narrung district. First among these was the dairy cow. If the dairyman wished to build up a good herd it was imperative that the calf should have every attention during its early life. As soon as the calf was able to eat hard food such as chaff and bran, or green feed, it should be allowed as much fodder as it could consume; that was most important if the animal was to develop into a cow of the best type. If the heifer calves were mated at 1½ years of age they would come into milk when they were about two years and three months old. By keeping them in a small paddock they could be handled by the dairyman so that they would be quiet when they came into milk. He favored the milking Shorthorn for the good dairying lands of their district. After the heifer had calved she should be carefully milked, and particular care taken to see that each quarter was thoroughly stripped. He strongly favored testing the cows, so that one would know which animals were bringing in a payable return. As a feed he recommended chaff and bran and green lucerne. If the green fodder was not available, chaffed lucerne hay should be allowed to soak in water over night, and with bran added, would make an excellent food for the cow. All stock should be provided with a good supply of clean drinking water. The writer suggested erecting a bush shed over the trough, and cleaning it out at least once every week. A nice roomy yard should be made for the bull. The animal of next importance was the pig. He gave preference to the Poland China-Berkshire cross. They matured quickly, and he had been able to market pigs of that breed when 5½ months old. The sows should have a small paddock for grazing and exercise. The farrowing sty should be dry and roomy, with a rail about 6in. off the floor to prevent the sow from crushing the young pigs. In the discussion that followed, Mr. Hackett thought the Jersey or Guernsey breed of cattle were best suited to the conditions of their district. Other members spoke, the majority being in favor of the Jersey cow as the best animal for the dairyman.

**ASHBOURNE**, August 2nd.—The Assistant Dairy Expert (Mr. H. J. Apps) attended the meeting and delivered an address, "Improved Methods in Dairying."

**BLACKWOOD**, August 23rd.—The Poultry Expert (Mr. D. F. Laurie) visited the Branch and delivered a lecture, "Feeding of Poultry under Present Conditions."

**CLARENDRON**, May 3rd (18 members, two visitors).—A paper, entitled, "The Conservation of Fodder," was supplied by Mr. W. Pearson, of Brinkley, and a good discussion followed.

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LONGWOOD.—On page 1078 of the May, 1920, issue it was reported that "samples of home-made fruit were exhibited"; this should be "samples of home-made soap."—Ed.

MACGILLIVRAY, July 28th.—The monthly meeting of the Branch was held at Mr. Nicholls' residence, when a paper, "Fallow and Fallow Crops," was contributed by Mr. Wheaton. A good discussion followed.

MEADOWS, July 28th.—Mr. Durwood delivered a short but interesting address, entitled, "Tobacco Culture," in which he mentioned several parts of the district that he thought were suitable for growing the leaf. Mr. A. O. Maidment tabled a few well-seeded maize cobs that he had grown during the previous summer.

MENINGIE, July 31st.—IMPROVEMENTS ON THE FARM.—In a short paper dealing with this subject Mr. H. B. Hackett drew special attention to the fact that on many farms the provision of proper gateways was absolutely overlooked. One too often saw a gate constructed out of a tangle of plain and barb wires, which was a constant source of danger to stock and vehicles. It was to be deplored that in many cases such gateways were made in fences across public roads, when, for a very small cost, a convenient gate could be provided. An interesting discussion followed.

MORPHETT VALE, July 31st.—The Hon. Secretary (Mr. A. F. Furniss) read the annual report, and the officers were elected for the coming year. Matters relating to the forthcoming Conference of Southern Branches were also brought forward for discussion.

### SOUTH-EAST DISTRICT.

#### COONAWARRA.

July 27th.—Present: 18 members and one visitor.

Mr. E. S. Alcock (Inspector of South-Eastern Experimental Plots) visited the Branch, and addressed the members on the advisability of preparing a district exhibit for the next March Show.

On July 20th the following pruning competitions were held:—Peach and apricot trees, at Mr. E. G. Alder's orchard; staked vines, at Mr. W. Snelling's; and trellised vines, at Mr. J. Redmand's and Milne & Co.'s cellar vineyards. There was a large attendance of members and visitors, and a most instructive and enjoyable afternoon was spent.

#### MUNDULLA.

August 11th.—Present: 13 members.

SAND IN HORSES.—Mr. A. Ross contributed a paper on the subject, "Sand in Horses." If the sand had been retained for some time, it would cause a weakening of the organs and often set up irritation. The common symptoms, however, generally included loss of condition, appetite—sometimes ravenous, then the reverse—falling in of the flanks, scouring, bulging of the belly, griping pains, paleness of the eyes, and passing sand with the dung. The action of the sand was to choke the glands of the stomach and block or silt up the blind gut or paunch. The best time to treat for sand was in the early stages. It was a good plan to treat all horses that had been on sandy pastures, whether they showed symptoms or not. By doing that one might avoid serious trouble. If the sand was allowed to remain it would become hard and cementy, it was then more difficult to shift. For horses that were broken in, a good dose of strong coffee—about  $\frac{1}{2}$ lb., or a little more to allow for waste—was very often effective, in fact, if given in the early stages, it would seldom fail. The value of the coffee was due to the fact that it stimulated the nerves and enabled the organs to break up the sand. For horses that were not broken in, or were difficult to drench, a pint of new milk with a pound of honey warmed up in it was a good remedy, because it could be given in the feed, and most horses became fond of it. It could be given as a drench if desired. The milk coagulated in the stomach and caused gases which broke up the sand, and the honey, by its stimulating effect, hastened the sand through the large bowel, enabling it to

be passed out more easily. Those remedies could be repeated if necessary, and generally would be found cheaper and more effective than bought medicines. For horses only slightly affected, boiled wheat was an excellent remedy, pollard also was very good, but, by the time it reached the sand, much of its power was lost. External rubbing of the belly with a pole or piece of pipe was recommended by some, because it broke up the sand and enabled it to be expelled. A bottle of yeast was another good remedy which often started the sand, even when others failed. It was advisable to keep the bowels open, but he would not advise using raw linseed oil because that glazed over the surface of the sand, and would prevent the remedies from acting on it.

FRANCES, July 31st.—The Hon. Secretary (Mr. A. M. Herold) read an article from the *Journal of Agriculture*, and an interesting discussion followed. The annual report was presented, and the officers were elected for the ensuing 12 months.

PENOLA, August 7th.—The question of the advisability of growing sugar beet and the erection of a mill was brought before the meeting, and a good discussion followed.

KYBYBOLITE, August 20th.—The Hon. Secretary (Mr. A. Hahn) read the annual report, and the officers were elected for the ensuing year. Mr. J. B. Harris (Orchard Instructor and Inspector) gave an address, "Orchard Work."

#### "PIG FACE."

Judging by the soil conditions, where "Pig Face" (*Mesembryanthemum aequilaterale*) grows naturally in this State, there does not appear to be a deficiency of any substance in the soil, but rather a high content of common salt, says the Superintendent of Experimental Work (Mr. W. J. Spafford) to a correspondent who desires to know what deficiency in the soil caused the plant to spread.

Cultivation and the growing of crops tend to reduce the quantity of salt in the upper layers of the soil, or at all events to prevent its rising and collecting at the surface.

The loosening of the soil will do some good, by tending to keep the salt down, and by killing the plants of "pig face," but what is really wanted is to cover the land with some other plants. For the land on which the "pig face" is spreading, other than the "Samphire" flats, the following fodder plants would very possibly grow well, much increasing the pasture and keeping down the weed:—Lucerne, King Island melilot, Wallaby grass (*Danthonia semi-annularis*), Toowoomba canary grass, Buffalo grass, Rhodes grass, *Paspalum dilatatum*.

Although the plant spreads quickly from a small plant to one covering much land, I do not think there is a doubt that practically all of the encroachment on to land left out of cultivation is by seed.

## CROWN LANDS.

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Full particulars will be published in the *Government Gazette*, and plans will shortly be available on application to the Secretary for Lands, Adelaide.

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### APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

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### ALLOTMENTS, SALES, TRANSFERS, SUBLEASES, AND MORTGAGES.

Notice is hereby given that in future no applications for land, or for transfer, sublease, or mortgage of Crown leases or agreements will be approved to unnaturalised persons of *any* nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

Where any doubt as to nationality exists, it will be necessary for certificate of birth or naturalisation papers to be exhibited.

The same principle will apply to land sold by auction.

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### OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

G. R. LAFFER,  
*Commissioner of Crown Lands and Immigration.*



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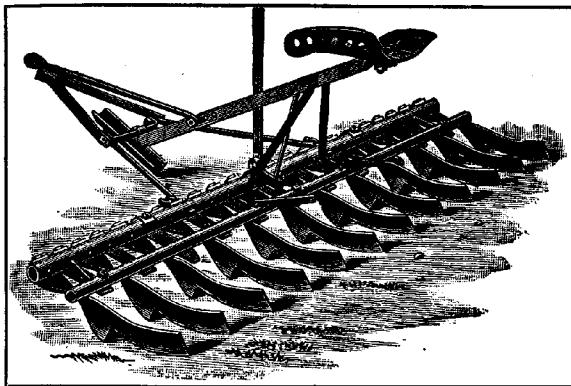
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